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SYMPOSIUM: TEN YEARS OF CHILD PSYCHIATRY AT THE MONTREAL CHILDREN'S HOSPITAL*

INTRODUCTION

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A CHILD psychiatric service was established at the Montreal Children's Hospital in September 1950. Its immediate aims were to aid in the establishment of sound mental health practices throughout the hospital, and most of the first two years was spent in trying to help all of the staff to understand the meaning of the behaviour of the hospitalized child in general and the deviant behaviour of some of the more disturbed patients.

The service also became a training unit of the Department of Psychiatry at McGill University when students of the McGill diploma course taking part of their training in child psychiatry, students training in social work and students training in psychology became residents or worked part-time at the hospital.

By 1953 the staff was sufficient in number and skill to concern itself with psychiatric problems of children in the community at large, whereas until that time only children attending the in-patient and outpatient departments of the hospital for other reasons had been treated. Once the service was extended to the community, the demands on the outpatient service became far greater than the resources provided.

A day treatment service was established in 1953 to provide facilities for investigating and treating a specific group of pre-school children who were so disturbed that neither their families nor any community service had been able to deal with them.

Any new psychiatric service is overwhelmed with parents of retarded children seeking diagnosis, help, guidance, and treatment for their children. As part of a pediatric hospital, it is possible that the day treatment service was presented with an unusually large number of these children. The community Parents' Association for Retarded Children asked the Montreal Children's Hospital to open a special clinic for their patients. In response, a mental assessment and guidance clinic was opened in 1955.

At first, patients requiring psychiatric hospitalization were brought into the regular pediatric wards, but it soon became apparent that a more satisfactory arrangement for diagnosis and short-term treatment was required. After a year of careful planning, a 14-bed inpatient psychiatric ward was opened.

It has been recognized that a special educational psychiatric approach is necessary to help children with learning and reading problems. To facilitate investigation, treatment and research into these problems, a learning clinic was established in 1960.

In September 1960 the Child Psychiatry Department of the Montreal Children's Hospital celebrated its tenth anniversary. On this occasion a special scientific program was arranged, at which the following papers by Drs. Winnicott; Hunt; Rabinovitch, Bibace and Caplan; and Statten were presented.

*A series of papers given at the Montreal Children's Hospital on October 7, 1960, on the occasion of the tenth anniversary celebrations of the Child Psychiatric Department.

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INTEGRATING AND DISRUPTIVE FACTORS IN FAMILY LIFE*

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IT WOULD be a truism to say that the family is an essential part of our civilization. The way we arrange our families practically shows what our culture is like, just as a picture of the face portrays the individual. The family continues to be important all the time and accounts for much of the travelling we do. We burst out, emigrate, go from east to west or from south to north, because of the need to break away, and then we periodically travel back home just to renew contacts. We spend a lot of time writing letters, sending telegrams, telephoning and reading about our relations in the journals; moreover, in times of stress most people become loyal to the family setting and suspicious of the foreigner. Nonetheless, despite this common knowledge, the family is something that deserves our detailed study. As a psychoanalyst, studying individual emotional development in great detail, the author has learned that each individual needs to make the long road from being merged in with mother to being a separate person, related to mother and to mother and father together; from here the journey goes through the territory known as the family, with father and mother as the main structural features. The family has its own growth, and the individual small child experiences the changes that belong to the family's gradual expansion and to its troubles. The family protects the child from the world, but gradually the world begins to seep in – the aunts and uncles, the neighbours, the earliest sibling groups, leading on to schools.

This gradual environmental seeping-in is the way a child can best come to terms with the wider world, and follows the pattern, exactly, of the infant's introduction to external reality by the mother.

It is recognized that our relations are often a nuisance, and that we are liable to grumble because of the burden of them. We may even die of them, yet they are important to us. One has only to consider the struggles peculiar to men and women with no relations at all (as, for instance, happens in the case of some refugees, and some illegitimate children) to see that the absence of relations to grumble about, to love, to be loved by, to hate and to fear, constitutes a terrible handicap; it leads to a tendency to suspect even quite friendly neighbours.

What do we find when we begin to dissect some of the very real stresses which we encounter as soon as we begin to look below the surface?

POSITIVE TENDENCIES IN THE PARENTS

There comes a time after the marriage ceremony when it is very convenient if children begin to appear. If children come immediately they can very well be a nuisance, because the two young people have not yet passed through the initial stage in which they mean everything to each other. We all know of first children who, by being born, broke up the relationship between their father and mother and who suffered on account of this. We also meet very many family settings in which children do not appear. Let us consider those cases in which children do appear and are a natural consequence of the relationship between the father and mother. Let us assume that the children are healthy. It has very often been said as a joke, but with truth, that children are a nuisance, but coming at the right time in a relationship they are the right kind of nuisance. There seems to be something in human nature that expects a nuisance and it is better that this nuisance should be a child than an illness or an environmental disaster.

The existence of a family, and the maintenance of a family atmosphere, result from the relationship between the parents in the social setting in which they live. What the parents can contribute to the family that they are building depends a great deal on their general relationship to the wider circle around them, their immediate social setting. One can think of ever-widening circles, each social group depending for what it is like inside on its relationship to another outside social group. Of course the circles overlap.

Many a family is a going concern, yet would not stand being uprooted and transplanted.

However, parents cannot be considered simply in their relationship to society. There are powerful forces creating and binding the family in terms of the relationship between the parents themselves. These forces have been studied in great detail. They belong to the very complex fantasy of sex. Sex is not just a matter of physical satisfaction. It should be especially emphasized that sexual satisfactions are an achievement of personal emotional growth; when such satisfactions belong to relationships that are personally and socially agreeable they represent a peak of mental health. On the reverse side, disturbances in the sex field are associated with all manner of neurotic disorders, psychosomatic troubles, and wastage of the potential of the individual. However, although sex power is vitally important, complete satisfaction is not in itself an aim when the subject of the family is considered. It is worth noting that a large number of families exist and are counted good, though built on a basis of not very powerful physical satisfactions on the part of the parents. The extreme

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*Adapted from an address given at Moyse Hall, McGill University, on October 6, 1960, on the occasion of the tenth anniversary celebrations of the Child Psychiatric Department, Montreal Children's Hospital.

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examples of physical satisfaction perhaps belong typically to romantic love, which is not necessarily the best basis for home-building.

Some people have but a poor capacity for the enjoyment of sex. Some frankly prefer auto-erotic experience, or homosexuality. However, it is obviously a very rich experience and fortunate for everyone concerned when the parents are able easily to enjoy the potency that belongs to individual emotional maturity. As well, there are other factors in the relationship between the parents which tend naturally towards the establishment of the family unit, such as the parents' deep-rooted wish to be like their own parents in the sense of being grown-up. Also there are the imaginative life and such things as an overlap of cultural interests and pursuits.

Considering that which may be referred to as the fantasy of sex, one must refer to matters that appear in the unusual frankness that belongs to psychoanalytic work. Psychoanalysis makes one wonder how a correct and adequate history of a marital case can be taken except as a by-product of a psychoanalytic treatment, or of the special conditions that go with psychiatric social work. The total sex fantasy, conscious and unconscious, is almost infinitely variable, and has vital significance. It is important to understand, among other things, the sense of concern or guilt that arises out of the destructive elements (largely unconscious) that go along with the love impulse when this is expressed physically. It can be readily conceded that this sense of concern and guilt contributes a good deal to the need of each parent, and of the parents together, for a family. The growing family better than anything else neutralizes the frightening ideas of harm done, of bodies destroyed, of monsters generated. The very real anxieties in the father at the time of the mother's parturition reflect as clearly as anything else the anxieties that belong to the fantasy of sex and not just the physical realities. Surely a great deal of the joy that the baby brings into the parents' lives is based on the fact that the baby is whole and human, and also in the fact that the baby contains something that makes for living—that is to say, living apart from being kept alive; that the baby has an innate tendency towards breathing and moving and growing. The child as a fact deals, for the time being, with all the fantasies of good and bad, and the innate aliveness of each child gives the parents a great sense of relief as they gradually come to believe in it; relief from ideas that arise from their sense of guilt or unworthiness.

It is not possible to understand the attitude of parents to their children apart from a consideration of the meaning of each child in terms of the parents' conscious and unconscious fantasy around the act that produced the conception. Parents feel quite differently and act quite differently towards one child and towards another. Much depends on the relationship between the parents at the time, and during the mother's pregnancy, and at the time of the birth, and afterwards. The effect of the mother's pregnancy on her husband comes into this; in some extreme cases the husband turns from his wife when she becomes pregnant, sometimes he is drawn more closely to her. In every case there is an alteration in the relationship between the parents, often a great enrichment and a deepening of the sense of responsibility that each has for the other.

We hear it said that it is strange that children can be so different from each other when they have the same parents and are brought up in the same house and in the same home. This leaves out of account the whole of the imaginative elaboration of the important function of sex and the way that each child fits specifically or fails to fit into a certain imaginative and emotional setting, a setting which can never be the same twice, even when everything else in the physical environment remains constant.

There are many other variations on this theme. Some are complex but some of them are obvious; for instance, the sex of the infant may profoundly affect the relationship between the parents. Sometimes it is a boy that is wanted by both; sometimes the mother feels frightened of her love of a boy baby, and becomes unable to allow the pleasure of the intimacy of breast feeding on this account. Sometimes the father wishes for a girl, and the mother wishes for a boy or vice versa.

It must be remembered that the family is composed of the individual children, each of whom is not only genetically distinct from the others but also very much indeed influenced in his or her emotional growth by what has been referred to as the way in which the new child does or does not fit in with the parents' fantasy: a fantasy that enriches and elaborates the physical relationship that they have, each in relation to the other. The most important thing in this whole situation is the tremendous reassurance that the live human infant brings through being a fact: real, and for the time being neutralizing fantasy and eliminating expectations of disasters.

Those who have adopted children will know how such children can fill the gap in the imaginative needs arising out of a marriage. Married people with no children can and do find all sorts of other ways of, in fact, having a family; they may be found sometimes to have the largest families of all. But they would have preferred to have their own born children.

Thus the two parents need the actual children in the development of their relationship each to the other, and the positive drives generated in this way are very powerful.

It is not enough, for our intended purpose, to say that parents love their children. They often do get round to loving them, and they have all sorts of other feelings. Children need more of their

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parents than to be loved; they need something that carries over when they are hated and even hateful.

DISRUPTIVE FACTORS COMING FROM THE PARENTS

In considering the difficulties of parents, it is always valuable to remind ourselves that parents are not necessarily fully mature just because they have achieved marriage and the establishment of a family. Each member of the adult community is growing, and continues to grow, one hopes, throughout life. But the adult has great difficulty in growing without throwing away the achievements of earlier stages of growth. It is easy for us to say that if people are mature enough to marry and have children they ought to be content to stay where they are and to cut their losses if they are not happy about themselves. Nevertheless we know that in fact men and women have much growth to achieve in the decades that follow the time of their marriage if they marry at all early. An early age is the best time for marriage, in terms of the establishment of a family. Children thrive best with parents who are 20 or 30 years older than themselves, and who are not too wise; such parents learn from their children and this has a lot to be said for it. Shall we hope that men and women will wait to marry until they are rich and perhaps smug? It is true, surely, that in the majority of cases men and women need to establish a platform (such as that provided by being married and having a family) and from this platform they eventually make further personal growth. They are often willing, easily willing, to wait for a number of years while their children are needing them for the family setting, and then they spurt forwards. Sometimes, however, there is a period of great strain before eventually the parents, or one parent, may restart a new phase of growth.

It is indeed difficult to achieve full growth during adolescence. Society does not like free experiment among adolescents, and there are always those who like children to be nice. "Nice" in adolescence means "not thoughtlessly forming relationships". The word "thoughtlessly" here refers to careless pregnancies and illegitimate children. Many children pass through their adolescence in a somewhat inhibited way. In the case of immature men and women who marry, many find great relief and enjoyment in the establishment of a family; but we must not be surprised if ultimately the growth of their own children challenges them to go further with their own growth that was held up at the time of their adolescence.

A social factor operates here. Important changes have taken place recently all over the world. If we are to have no more wars, then no longer can we provide the distraction from adolescent problems that war provided. So we find everywhere that adolescents are establishing adolescence as a phase in development that must be taken into account. It is essentially a phase of difficulty, and of a mixture of dependence and violent independence that passes as the adolescent becomes adult. (We must not be misled by the fact that new adolescents come along to keep the pot boiling.)

A great deal of what we see complicating family life is that which parents do when they come to the end of their ability to sacrifice everything for their children. Delayed adolescence in one or both parents is beginning to make itself felt. Perhaps this refers especially to the father, because the mother so often discovers herself in the unexpected physical and emotional events that belong to motherhood. She too, however, may come at a late date to a tremendous need to experience romantic or passionate love which she avoided earlier because she wanted the right father for her children.

What now happens to the family? We are aware that in the vast majority of cases enough maturity exists in the parents to enable them to make sacrifices themselves, as their parents did for them, in order to establish and maintain their family, so that the children may not only be born into the family but may grow and may reach adolescence in the family, and may in relation to the family pass through to achieving an independent and perhaps married life. However, this is not always possible.

We should not despise those who were not very mature at the time of marriage and who cannot afford to wait indefinitely, and for whom the time comes when they must make new spurts forward in personal growth or else degenerate. Difficulties occur in the marriage, and the children then have to be able to adapt themselves to the family disruption. Sometimes parents are able to see children through into a satisfactory adult independence in spite of the fact that they themselves have found a necessity for breaking up the framework of a marriage, or perhaps have found a need for remarriage.

In a proportion of cases young married people deliberately avoid having children, knowing that although they have attained something valuable by being married, this is an unstable state of affairs; and knowing that they may have to make new experiments before being ready to establish a family, which they intend to do eventually. They intend to establish a family partly because this is natural and partly because they hope to be like other parents and so to become socialized and integrated into the community. But a family is not the natural result of a romantic love-affair. In the more unfortunate cases there is a state of chaos arising from difficulties of an extreme kind between the parents which makes it impossible for them to co-operate even in the care of children of whom they are fond.*

*In Great Britain, since The Children's Act of 1947, the state makes itself responsible for every child in England, Scotland and Northern Ireland who is deprived of a home life, and there is a complete service which covers the whole country. The main aim of the Children's Department in each locality is to place children in foster homes, to supervise such placements, and to see each child through to adult independence.

It is impossible within the framework of this paper to develop this part at great length—for example, comment on the disruptive effect of physical or mental illness has been deliberately omitted—but an attempt has been made to show how important is the study of the integrative and disintegrative factors making for family life or for its disruption: factors that come from the relationship between a man and woman who have married and the conscious and unconscious fantasy of their sexual lives.

POSITIVE TENDENCIES IN THE CHILDREN

In considering the other half of the problem, that is to say the integrative and disintegrative factors relative to family life which comes from the children, it must be remembered that each parent has been a child and to some extent still is a child.

It cannot be too strongly emphasized that the integration of the family derives from the personal integration of each child. Integration of the individual is not a thing that can be taken for granted. Personal integration is a matter of emotional growth. In the case of every human being a start has to be made from an unintegrated state. Much work has been done on this matter of the earliest stages in infant development, when the self is first becoming established and yet is still absolutely dependent on maternal care for making personal progress. In ordinary favourable conditions (which have to do with the mother's close identification with her child, and later on with the combined interest of the two parents), the human infant becomes able to give evidence of an innate tendency towards integration, this being part of the growth process. The process of growth must take place in the case of each child; integration can never be taken for granted. If conditions are favourable at the earliest stages of great dependence, and an integration of the personality occurs, this integration of the individual, which is an active process involving fierce energies, affects the environment. The child who is developing well, and in particular whose personality has been able to achieve integration from within by the innate forces belonging to individual growth, has an integrative effect on the immediate environment; such a child "contributes in" to the family situation.

This "contributing in" from each child may be forgotten until one experiences the shock of a child who is ill or defective, and who for one reason or another is not "contributing in", and observes how the parents and family suffer in consequence. Where the child is not "contributing in", the parents are burdened with a task which is not altogether a natural one—they have to supply a home setting and to maintain this setting, and try to keep up a family and family atmosphere in spite of the fact that there is no help to be derived from the child. There is a limit beyond which parents cannot be expected to succeed in such a task.

Society depends on the integration of family units, but it is important to remember that these family units in turn depend on the integration which takes place in the growth of each member. In other words, in a healthy society, one in which democracy can flourish, a proportion of the individuals must have achieved a satisfactory integration in their own personality development. The idea of democracy and the democratic way of life arises out of the health and the natural growth of the individual, and can be maintained in no way except by the integration of the individual personality, multiplied many times according to the number of healthy or relatively healthy individuals that may exist in the community. There must be enough healthy individuals to carry the unintegrated personalities who cannot "contribute in", otherwise society degenerates from a democracy.

It will be seen as a corollary of this that it is not possible to make a community democratic, since by undertaking the task of making the community democratic one is already applying a force from outside which is only effective if it comes from within, from each individual's health. However, a healthy society carries a proportion of passenger members. A healthy family too can carry children whose integrative tendencies are weak.

Each child, by healthy emotional growth and by the development of his or her personality in a satisfactory way, promotes the family and the family atmosphere. The parents, in their efforts to build a family, benefit from the sum of the integrative tendencies of the individual children. It is not simply a matter of the lovableness of the infant or the child; there is something more than that, for children are not always sweet. The infant, the small child, and the older child flatter us by expecting a degree of reliability and availability to which we respond, partly because of our capacity to identify with the children. This capacity to identify with the children again depends on our having achieved an adequate growth in our own personality development when we were at the same age. In this way, our own capacities are strengthened and are developed by what is expected of us from our children. In innumerable and very subtle ways, as well as in obvious ways, infants and children produce a family around them, perhaps by expecting something, something which we give because we know something about expectation and about fulfilment. We see what the children create when playing at families, and we feel we want to make real the symbols of their creativeness.

Parents are often able to fulfil the expectations of their children in a way or to a degree that is better than that which they experienced from their own parents. There is a danger here, however, that

when they do better than their own parents beyond a certain degree, they inevitably begin to resent their own goodness, and indeed they tend to break up what they are doing so well. For this reason, some men and women can let themselves do better with children who are not their own than with their own children.

DISRUPTIVE FACTORS COMING FROM THE CHILDREN

From this one passes to a consideration of the disintegration of the family brought about by lack of development in the child or by the development of illness. In certain psychiatric illnesses of children there are tendencies of a secondary nature which develop and show themselves as an active need on the part of the child to break up anything that is good, stable, reliable or in any way valuable. The outstanding example is the antisocial tendency of the deprived child who is most destructive of family life. The family, whether the child's own or a substitute family or community, constantly comes under test, and when tested and found reliable becomes the target of the child's destructive urges. This touches on the major problem of making provision for children with antisocial tendencies. It is as if the child is looking for something worth destroying. Unconsciously, the child seeks something good that had been lost at an earlier stage, and with which he is angry because it went. This is a separate subject, but it must be mentioned amongst all the patterns of disruption of family life that derives from the child's lack of development or distorted growth.

FURTHER DEVELOPMENT OF THE TWO THEMES

There is much that could be said about the interplay of all these various factors, factors that concern the parents and their relation to society and their wish to have a family, and factors that arise from the innate tendency towards integration that belongs to individual growth, but which – at any rate at the beginning – depend on the provision of a suitable environment. There are many families that remain intact if the children happen to be developing well, but that cannot stand the presence in the family of an ill child.

In assessing a child in regard to suitability for psychotherapy, we find ourselves thinking not only of the diagnosis of the illness and of the availability of the psychotherapist but also of the capacity of the family to tolerate, and in fact to "hold" the child who is ill, and to tolerate the child's illness over the period of time before psychotherapy begins to take effect. In many cases it can be said that the family has to turn itself into a nursing home or even a mental hospital, in order to contain the illness or treatment of one of the children. Whereas many families are able to do this, in which case psychotherapy is a relatively simple matter, other families are unable to do so, and we then have the task of placing the child away from the family. The task of psychotherapy in this case is very much more complex, and indeed it is exceedingly difficult to find suitable groups for placement of children who are not able to "contribute in". As the child has relatively little integrative tendency to bring to this group, the group must hold the child and the illness.

In many cases parents who are quite capable of producing healthy children and of giving them a good family setting do in fact, for reasons which are not of the kind for which one could blame them, find that they have in their midst an ill child, either anxious or subject to psychosomatic disorder or to depression, or a child who is very much disintegrated in personality, or perhaps antisocial. The task must then be undertaken either of asking parents to nurse the difficult child while we try to help the child, or alternatively of asking the parents to give up the task, letting them know in fact that although they can set up a home and maintain it for normal children, nevertheless the family that they have created is not able to tolerate this one particular child who is ill. They must be relieved of the responsibility for the time being. Often it happens that parents cannot stand being helped in this way, although they also cannot stand the alternative.

Very difficult problems of management surround this sort of case and these matters are mentioned only to highlight the central theme, which is that there is something in the healthy development of every child that is at the basis of the integration of the family group. In the same way it is the healthy families that make possible the wider integrations, the wider groupings of all kinds, groupings which overlap and which are sometimes mutually antagonistic, and yet which can contain the germ of an ever-widening social circle.

The child cannot of course produce this family by magic – that is, without the parents and the parents' wish arising out of their own interrelationship. Nevertheless, each infant and child creates the family. It is true that parents bring about the existence of the family, but they need something from each infant and child – that which may be considered the individual child's creation. Failing this, the parents lose heart and will simply have a family setting unoccupied. They may of course adopt a child, or they may in some other way find indirect means of having the equivalent of a family. The strength of the family comes from its being a meeting-place between something that arises out of the relationship of the father and mother, and something that comes from the innate factors that belong to the emotional growth of the individual child, factors which have been put together, for the purposes of this paper, under the heading of "tendency towards integration".

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A DAY TREATMENT APPROACH TO EARLY DISORDERS OF ADJUSTMENT*

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THE DEPARTMENT of Psychiatry of the Montreal Children's Hospital was established in 1950. It was not long before increasing demands led to the development of new units. By early 1953, a number of pre-school children with serious personality disorders had become a cause for concern. They presented major difficulties in their relationship to the family and posed a challenge to therapeutic and diagnostic skills. After a period of growth, during which it was referred to simply as the nursery school, one of these new units, named the Day Treatment Centre, was opened in October 1953 in order to meet the needs of these children and their families.

The centre's program was designed to provide both individual and group therapy for mothers and children. When practical, fathers were included in the program as well. At this time, the majority of children suffered from childhood schizophrenia, as exemplified by the following illustrative case.

Carol had done a great deal of head banging and body rocking all her life, but particularly before she was 2½ years of age. When she was 3, her mother became aware of her clumsiness and her poor co-ordination for the first time. She also noticed that Carol was a great deal on her own and was preoccupied with the repetitious play of putting wooden blocks in and out of boxes. She was still not talking. Shortly after this, she began producing an almost continual incoherent mutter in which no words could be distinguished, and it was not until she was 4 that her mother noticed the first clear single words. On one occasion, at the age of 5, Carol dropped a marble she was playing with and became panic-stricken. She clasped her head in her hands and moaned: "My head, my head." For several days following this she was heard to mutter to herself "sew it up; sew it up", while making stitching motions around her neck.

It was not long before the centre was serving two major functions, diagnostic and therapeutic, with an overlap inevitably occurring between the two functions—an overlap in which, on the one hand, a child would be seen for diagnostic sessions prior to full admission for therapy and, on the other, the diagnosis would be gradually clarified during many months of therapeutic effort. In general, the diagnostic categories of children attending the centre comprised one-third with psychoses, one-third with borderline psychoses and one-third with a neurotic disturbance. In each of these categories were some children whose disorder was complicated by some degree of retardation or brain dysfunction. In a few instances, other conditions came to light. Two children were found to have deafness, and one aphasia, as the major determinant of their behaviour disorder. In a few others, retardation was considered to constitute the major difficulty.

The diagnosis was not as clear-cut as suggested, for the majority of children. For many, considerable doubt and difficulty were encountered in estimating the role of the various factors involved. Hirschberg and Bryant[2] noted: "Observations of children who have been grouped as schizophrenic indicate that we have different genotypical syndromes producing similar phenotypical patterns; these observations also indicate that we are not justified in assuming that either constitutional or structural factors, on the one hand, or psychological factors, on the other, function as sole and exclusive etiological determinants. Usually there is a complex interaction of both sets of factors which leads to the particular adaptive pattern that we have labelled as childhood schizophrenia. Observation of these children also suggests that there are such wide variations in etiological factors and in the resultant adaptive patterns that one should seriously question perpetuating as an entity the classification of childhood schizophrenia."

The evaluation of the role of brain injury in any schizophrenic pattern of behaviour is particularly difficult. A brain-injured child may have profound emotional problems arising from his peculiar perception and absorption of reality, and his regulatory instability. Outwardly, he may seem very similar, yet inwardly be quite dissimilar to either his peers or his parents.[1]

The inability of the parents to understand the child may contribute to deep, vague guilt within themselves, and to their rejection of him. To say that a brain-damaged child with a schizophrenic pattern of adjustment is not able to establish contact with others is often an over-simplification that distorts and conceals capacities for relationships that can be nurtured if the adult is willing to establish contact on the child's level in the areas where the child is most able to perceive, to integrate, and to gain pleasure from reality.

In establishing the centre, the approach established by Rank and her co-workers at the James Jackson Putnam Center in Boston was used as a model.[3] This approach to the treatment of young children with atypical development included the use of a modified nursery school as the "outstretched arm of the therapist". The ideas of Rank which served as the cornerstone of our efforts can best be expressed in her words:

"In order to establish a relationship with a child who escapes from an imaginary or actual danger in reality, by exclusion of people from its own world of magic and fantasy, we must provide by way of restitution: an environment with the right emo-

*Adapted from a paper read at the Montreal Children's Hospital on October 7, 1960, on the occasion of the tenth anniversary celebrations of the Child Psychiatric Department.

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tional climate; a temporary mother substitute; help for the real mother so that she may eventually be able to take over and herself meet her child's need. In brief, we have a three-fold approach—individual therapy with the child, individual therapy with the mother, and nursery school.

". . . When we stress the need for an accepting mother substitute for a child of such scattered levels of development, we must have a definite notion of what we mean.

"A reciprocal identical response to each other's activities is established. It is as if we were offering to the child a mirror in which to look at himself without fear or shame. If we were to introduce any change or variation of the theme, it would be a slight and subtle one. The play becomes, one might say, an exercise in projection and introjection to enable the child to learn to differentiate between himself and the outside world. By creating an opportunity for them to repeat and re-learn earlier, not assimilated situations, one is able to help the child to establish, or find himself, on a given infantile level and to experiment with the next stage of development. When the ego of the child acquires a certain strength and integration, as evidenced by his taking us as a love object, only then can we act as a mother substitute who not only accepts, but educates by sharing reality experiences, giving concrete knowledge while at the same time recognising fears and conflicts as they come to expression in the course of treatment. But until the child is established as a person who seeks out our approval and support, the resolution of conflicts is at a minimum."

In the Day Treatment Centre of the Montreal Children's Hospital, individual therapy with the child, based on analytically oriented psychotherapy, was given in part by resident psychiatrists and in part by staff psychiatrists. The majority of mothers were seen individually by psychiatric social workers, a few receiving psychotherapy from psychiatrists. The mothers' groups were led by social workers or by psychiatrists.

The children also attended a modified nursery school program. The total number of children attending at any one time was usually about 18, but in the light of experience, this number was later divided into three groups of six children, each with two teachers. These groups attended three times weekly for a period of two hours. This size of group has so far proved to be most effective in dealing with diagnostic problems, therapy and the demands of the case load. However, the frequency and duration of attendance were quite flexible and varied from time to time with the needs of the group concerned.

WORK WITH THE CHILDREN

Within a few weeks of attendance many children showed increasingly primitive behaviour. It is difficult to say how much of this was due to the dropping of defensive inhibition and how much was an actual regression. Sucking a bottle, messing food with the hands, long periods of apparently meaningless water play and constant aggressive overactivity needed to be tolerated, often for many months, before the beginnings of less extreme behaviour became evident. Likewise, extreme fears had to be tolerated with a reassuring matter-of-fact handling of the situation. Especially important in this initial period was the child's unwillingness to separate from the mother, or the mother from the child. Such separation was allowed to occur at its own pace, the mother sitting in the room during the session. The final separation was often achieved following the establishment of the relationship between mother and social worker and between the child and his new environment.

Physical contact was often the first approach to the child. Alertness was required to detect his readiness for this, since such an approach can mean an attack to the child and may provoke a withdrawal, even though at other times the child may seek such contact for himself. Some children would withdraw, become panicky, or exhibit tantrums at the first signs of an approach.

Many of the children, when left to themselves, would spend hours rocking, watching a shadow, chewing or twirling a string. Attempts were made to establish contact with the child through these preoccupations. One boy, for instance, would give his string to the teacher when she asked for it. This eventually developed into a give-and-take game. It was also used to improve the child's clumsy muscle control by tying the string to a toy which he would try to undo. It was only in this situation that he showed enough motivation to do anything at all.

For some children a structural situation provokes more anxiety and anger, while for others there is a need for definite structuring. There are also children who need an opportunity for more free expression of hostility and others who become terrified of their own anger and need help to control it. These difficulties are dealt with in part by careful attention to the composition of any one group, and in part by planned interaction between child and teacher. This last includes encouraging the child who tries to break windows to break boxes, or to use a hammer and nails, if better able to appreciate reality. For the child known to have great hostility to a sibling at home, it may include measures to protect him from the anxiety arising from his hostility to the other children in the group.

After the first two years of attendance, increased emphasis was directed to teaching appropriate social responses. The child might be told that such and such silly talk would result in other children laughing at him; or he might be told that such and such behaviour would make people angry with him. This was usually preceded by a longer period when emphasis was placed on what is real and what is imaginary.

INDIVIDUAL THERAPY WITH THE CHILDREN

It is impossible to outline briefly any adequate picture of this aspect of treatment, since such a wide variety of skills and experience is drawn upon. In general summary: the first effort is directed towards establishment of contact with the child at whatever level he will permit, while protecting him from experiencing excessive aggression or anxiety. When the therapist has some concept of what the child is experiencing, he begins to verbalize it, at first reflecting and describing the activities, later verbally seeking the underlying meanings.

INDIVIDUAL WORK WITH THE MOTHERS

It was often difficult to evaluate the family at the time of application because the child's disturbing behaviour seemed to be an important factor in the profound disruption of family life. It was difficult to judge what sort of family integration might have existed before the appearance of the child's disturbance. It was also difficult to obtain an accurate history of the child's development. One mother stated that her child had never been breast-fed, but many months later disclosed that, in fact, she had had a lot of breast milk, but had been persuaded to discontinue feeding because of her own nervousness. Despite this, she had continued to breast-feed the baby for one to two months because of the discomfort due to having so much milk. She remembered worrying about whether this might have caused the diarrhea which she felt initiated her child's whole emotional problem. It was only in this connection that it was learned that the child had had digestive upsets and diarrhea for the first six months of life and that the mother had suffered off and on for many years from "colitis".

At the beginning, it was necessary to help with the everyday problems that came up in connection with the child's care, and the guilty feeling in the mothers that they were responsible for the disturbance. It was necessary to appreciate the difficulties of the daily routine with the objective of relieving some of the guilt and self-depreciation without bringing these directly to light. From this point, one could proceed to explore the devices the mothers had found to be successful in dealing with the child, putting these questions in terms of the child—by asking, for example: "What things will he use outside?" When the mother seemed ready to express some ability to care for the child, this query was changed to: "What have you found he will do?" During this phase care was necessary to avoid encouragement of too much dependency.

The physical closeness of mother and child sometimes presented problems. One mother would keep her child near her by such devices as bringing toys to a chair and calling to the child to come and play with them. Although she kept him near her, she never spoke about him except in derogatory terms. The therapist would not pick up these remarks but would comment that the child was nicely dressed. When this mother had begun to respond to a few favourable remarks about her child, the therapist began to indicate the mother's part in this by asking where she had bought the clothes, indicating by her remarks that two factors were involved: what the mother did for the child and the way the child, as a different person, felt about it. No attempt was made to separate child and mother in this manner in respect of problem areas, since this would become a direct attack on the mother herself.

One mother was describing an incident in which her child had been very upset when a younger sister vomited. The mother added, referring to the patient, "she was afraid her insides were coming out." Since this child could not speak, it was clear that this was the mother's imaginative interpretation of her child's feelings. Any comment to this effect would have increased her own anxiety about the child's sickness and thus, indirectly, her difficulties concerning herself.

In other cases, children separated from their mothers without any recognition that they had gone. This represented a disguised separation problem, since mothers would complain that they were not told what was going on during the period when they were not with their children.

Many mothers were able to express only their worst fears about their children, and the kind of difficulties they could involve them in, after discussion of the impact upon them of the continuing and persistent need to handle a very disturbed child. Their wish to be well-integrated people themselves could then be recognized as being threatened by the child's behaviour. From this point it was often possible to introduce discussion of their earlier difficulties in trying to mother their children.

One mother described very vividly holding her four-month-old baby on her lap as the baby screamed about something the mother could not understand. She described how it dawned on her, after a while, that some of the tears on her baby's face were not the baby's but her own. In instances of such closeness between mother and child, the feelings that are shared most intimately are those of sadness and rage. There were very few instances of sharing pleasure or love. Therefore, efforts were made to discover any small way in which the mother could obtain some kind of pleasure and satisfaction from her child at the time.

GROUP WORK WITH THE MOTHERS

Often during the first months of group discussions, the mothers were able to relieve some of their confusion, anxiety, guilt and hostility, as well as overcome some of their feelings of social isolation. Later, there was increasing recognition both of their own involvement in their children's problems and also of other problems in their lives. As this was

occurring, there were often frantic attempts to evade, by denial of all family difficulties, the main source of anxiety—namely, their guilt about their child's illness. It was only after more than a year's work with any one group that individual mothers began to see some of their characteristically unhealthy ways of relating to other members of the group, and this, in turn, led back to their relationship to their own families or to their problems with their children.

FOLLOW-UP STUDY

Between October 1953 and September 1956, 43 children were admitted to the Day Treatment Centre. In September 1956, 26 had left and 17 were still attending. In January 1957, the 26 who had left were invited to visit the hospital. The length of their treatment had averaged about two years. A team consisting of a psychiatrist, psychologist, social worker and teacher saw each mother and child, both together and separately, during the two-hour period of re-evaluation. The findings were considered at a staff conference and the child and mother were rated as "improved" or "unchanged" as compared with the first evaluation. This evaluation indicated that 10 of the children showed "severe" disturbance, eight "moderate" disturbance and eight "limited" disturbance; and that 14 were "improved" and 12 were "unchanged" at the follow-up re-assessment.

The group of children who had improved were compared with the group who had not improved. Factors which seemed to make a difference between the two groups were: (a) age on admission (more younger children improved); (b) the possibility of complete intelligence testing as indicative of some ability to relate (all children with average intelligence on testing, and all for whom complete testing was possible, showed improvement); (c) presence of speech (five of seven with good speech improved); (d) degree of disturbance (six of seven children with limited disturbance improved); (e) the parents' ability to improve (which led to improvement in the total family relationships). On the whole, it appeared that the centre was more successful in helping parents with the problems their children presented to the family than in helping the child himself.

Since this follow-up study was completed, there has been some change in emphasis in the various functions of the centre. Some of the effort to produce change in the child has been redirected towards increasing the stability of the total family relationships. In particular, increased effort has been made to bring fathers into the treatment program. Some of the change of emphasis was determined by changes in the demands made by the families referred. A greater range of diagnostic problems was seen – e.g. children with varying degrees of brain damage, children with rather severe early deprivation syndromes and, particularly, children with retardation and behaviour disorders of varying degrees of severity. There has been a corresponding extension of service in the centre to treat these latter children. More recently, discussions have been instituted which, it is hoped, will lead to research programs in this field.

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SEQUELAE OF PREMATURITY: PSYCHOLOGICAL TEST FINDINGS*

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RESEARCH INTO human behaviour must be understood in both biological and social terms. The biological and the social aspects of man are in constant interaction; each seems able significantly to influence the other, though, unfortunately, with our present knowledge, the sum of the parts does not equal the whole. This is especially true in the case of children, where the biological aspect frequently seems to hold sway over the social, and where both these aspects of behaviour are in rather rapid transformation.

The terms maturation and development may be considered as roughly parallel to biological and social. Maturation refers to growth and change in the child, which is relatively independent of exercise or training or learning, and development refers to growth and change in the child in the sense of acquiring or learning behaviour patterns through the interchange that takes place constantly between the maturing child and his environment.

Writing about the gradual differentiation of the ego, Hartmann, Kris and Loewenstein[3] state: ". . . During the undifferentiated phase there is a maturation of apparatuses that later will come under control of the ego and that serve motility, perception and certain thought processes." This

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*Adapted from a paper read at the Montreal Children's Hospital on October 7, 1960, on the occasion of the tenth anniversary celebrations of the Child Psychiatric Department.

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formulation would seem to imply clearly that if there should be any disturbance in the maturation of the "apparatuses" one could anticipate shortcomings in development, in ego function, or in "motility, perception, and certain thought processes". It was in line with this thinking that Statten[6] reported finding correlations between electroencephalographic (EEG) changes and reading disabilities and that Caplan[1] discussed the role of the body-image concept in child development and later[2] specifically the possible relationship between deviant maturation and the pathogenesis of anxiety. Scott[5] wrote about the "body scheme", which included both the perception of the biological body and the history of the close developmental relationships of space and time organization. He suggested that the continuous organization of inner and outer space was the real developmental challenge to the child, and further suggested a relationship between spatial organization, language, motility and form perception.

Since that time subtle forces have been at work at the Montreal Children's Hospital, gently pressing for further research into the biosocial problems of deviant development.* For a number of years various members of the Department of Psychiatry had spoken of children with both behaviour and learning problems who had a history of prenatal and/or paranatal deviations. The notion that "minimal brain injury" is responsible for the behaviour seen in this group of children is still widely maintained. On an epidemiological level Pasamanick, Rogers and Lilienfeld[4] demonstrated a definite relationship between deviant experiences at or before birth and subsequent behaviour and learning difficulties, but no data have been presented to point up the possible reasons for this relationship.

Several of us, realizing that our observations, as well as most of those of Pasamanick and his coworkers, had been based on an abnormal population,† began to wonder about "normal" children who had deviant experiences at birth or before. What, we wondered, was happening to those children in this category who do not come to clinics, or were there none such? We thought of the child's environment and his family, and we wondered about the possibility of a child with a developmental deficit managing very well in one type of family setting, and managing very poorly in another. In other words, a child's environment might either counterbalance or exaggerate the potentially harmful effect of an early developmental deviation.

It would have been preferable to study a number of different kinds of prenatal deviations. However, after looking through hospital birth records, it became quite clear that the only reasonably reliable data available referred to premature births; it was therefore decided to study such children.

One hundred males were selected at random: 50 prematures and 50 full-term births (controls), half of each group being seven years old and half 11 years old. All were said by their doctors to be in good physical health, and all were of at least average intelligence.

The premature group had birth weights between 1500 and 2250 grams. They all came from private and semiprivate confinements. Two age groups, 7 and 11, were used in order to obtain a glimpse of any longitudinal picture—that is, to be able to note whether a developmental deviation in the 7-year-old premature group had disappeared by the age of 11.

Each child was given a series of physical and psychological examinations and tests. The psychological tests sought to evaluate general intelligence, motor co-ordination, visual perception, reading ability, and concepts of space, of time and of number.

Each child and his parents were interviewed by a psychiatrist. Each home was visited several times by a social worker.

The results of the psychological tests to date have been surprising.

Measured Intelligence

Using the full Wechsler Intelligence Scale for children, the following picture emerged. The control subjects had an average intelligence quotient (I.Q.) of 116, while the prematures had an I.Q. of 108. When subjected to statistical analysis, it was found that this difference of 8 points was a significant difference ($P < .02$). Further analysis indicated very clearly that there was a greater discrepancy between our older controls and our older prematures than was the case among the younger subjects (older controls: I.Q. 116; older prematures: I.Q. 104).

Perceptual-Motor Behaviour

In test situations which required physical coordination and the integration of perceptual and motor skills, it was found again that the control subjects were superior to the prematures. Thus on the Bender Visual-Motor Gestalt Test* the performance of the control group is significantly better than that of the prematures (controls' mean score: 87.2; prematures' mean score: 59.3; $P < .05$). Again there was a greater discrepancy between control and premature among the older subjects than among the younger.

*The recently established Learning Clinic, with its emphasis on body image, on spatial orientation, and form perception, may also be seen as an outgrowth of this historical trend.

†Most children involved tend to come to the attention of psychiatrists or psychologists, or social workers, because of behaviour or learning problems.

*In this test the subject is given pencil and paper, presented with nine cards (one at a time) each with a design printed on it, and is asked to reproduce each figure to the best of his ability. The scoring is based to a slight extent on accuracy of reproduction but mainly on the subject's ability to reproduce the organization or perceptual gestalt of each stimulus figure.

On the Lincoln-Oseretsky Scale of Motor Development the control subjects were clearly more advanced than the prematures. As a group, the controls rate at about the 60 percentile level, while the premature group is at the 40 percentile level.

DAY-TO-DAY DEVELOPMENTAL TASKS

In general, a very strong trend was found for the controls to have accomplished earlier the mastery of developmental tasks. For example, the mean age of walking was 16.2 months for the prematures and 12.3 months for the controls. Use of sentences was mastered at 27 months for prematures and at 23 months for the controls. Ability to tie shoelaces was accomplished at 5 years, 4 months for prematures and and at 4 years, 11 months for the controls. Ball catching, bicycle riding and swimming have all revealed differences, always in favour of the controls. Admittedly this type of datum is retrospective and subject to many sources of error, but the consistency is very striking.

It would seem then that there are reliable differences between prematures and matures in the areas of general intelligence, sensory-motor co-ordination, and also in certain aspects of perceptual functioning, all in favour of the control group at each age.

These data further support the now well-rooted trend towards an "ego" psychology approach to the understanding and treatment of behaviour deviation in children. Another implication is that considerations should be given to problems of body-image, spatial orientation, visual and possibly auditory perception, and motor co-ordination, as probable relevant basic factors in the understanding of the emotional, learning and interpersonal difficulties encountered by children with early developmental deviations.

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DEPRESSIVE ANXIETIES AND THEIR DEFENCES IN CHILDHOOD*

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THE SUBJECT of depression in childhood is controversial, less well understood and less often diagnosed in child psychiatry than in adult psychiatry. The most renowned textbook on child psychiatry[6] does not refer to depression in its index. Although chapters are devoted to anger, jealousy, fear, there are none which deal with sadness, grief, melancholia or mourning. There is one reference to loneliness. The absence of a chapter on depression is not an omission but rather reflects the belief that the term "depression" should be reserved for adult states.

Little has been written on depression by North American child psychiatrists. Spitz[10] used the term "hospitalization" first for what he later referred to as "anaclitic depression". Engel and Reichsman[3] have brought to our attention the fascinating and much discussed case of Monica and described her condition as depression. Benedek's[1] paper "Towards the Biology of the Depressive Constellation" is most stimulating to child psychiatrists. "Separation anxieties" have been described, but their relationship to childhood depression has not been developed.[5] Childhood depression has been discussed more extensively by British child psychiatrists since 1935.[7]

Childhood depressive states, in the form of homesickness, became an interest of the author's in 1947. Since then, reports of 75 cases in 15 different camps situated in the U.S.A. and Canada, and many other cases in the Taylor Statten Camps in Ontario, as well as cases on the wards of the Montreal Children's Hospital, have been studied.

Homesickness can manifest itself in a variety of ways. It is often, but not always, related to being away from home. It may also be a means of escape from feelings aroused in attempting to get along with strangers, or a way of attracting attention in a lonely situation, or simply a way of manipulating others to arouse their concern and sympathy. In its most natural form it is related to the struggle of growing up. It can be defined as a symptom complex, usually associated with separation from home, which reflects an underlying depressive state, to which a child is attempting to adjust. Another word for homesickness is "nostalgia", which is derived from the Greek words "noster" meaning return, and "algos", meaning pain. A simple English word which has much the same meaning as nostalgia is "pining".

McCann[8] points out that nostalgia is an ancient condition affecting all the peoples of the world, in all ages. It is even more fundamental than human nature, as it can be seen in both wild and domesticated animals. In Psalm 137:1, we read:

By the waters of Babylon
When we sat down, yes, we wept
When we remembered Zion.

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*Adapted from a paper read at the Montreal Children's Hospital on October 7, 1960, on the occasion of the tenth anniversary celebrations of the Child Psychiatric Department.

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Hippocrates noted that whenever the people of the mountains or plains were sent to another country a terrible perturbation always went with them, and that from the moment of birth people seemed to be impregnated by topographical influences. Modern publications dealing with this subject appeared as far back as 1685, and there have been many since that time. Many recent articles have dealt with the disturbances arising within the millions of human beings torn against their will from their native countries.

SYMPTOMS AND SIGNS

The most common symptoms are "crying", "loneliness", and "despondency" which were observed in three-quarters of the cases. The next most frequent symptoms which appeared in approximately one-half the cases were the "desire to go home", "poor appetite" and "inactivity". It is somewhat surprising that the "desire to go home" is not more frequent. However, we are all very familiar with the child who is courageously trying to work out such homesick feelings. "Poor appetite" and "inactivity" are often the first symptoms of physical illness and therefore we must not be too hasty in considering these as indications of homesickness, without ruling out the presence of organic illness. These are likewise common symptoms of depression in adults.

There is another important group of symptoms which can represent or suggest physical illness, or may merely be the physical components of emotional stress and anxiety. These were present in approximately one-fifth of our cases, and in order of frequency are: poor sleep, abdominal pain, headache, constipation or diarrhea or both, and vomiting. It goes without saying that these children should be examined by a doctor.

Another group of symptoms that appears with about the same frequency as the foregoing (i.e. in one-fifth to one-quarter of cases) is perhaps the most difficult group to handle. These are feelings of being persecuted, feelings that "everybody is against me" and "nothing is the way it should be".

Other symptoms which have been included in the check-list are: excessive dependency, restless activity, appearing in about one-fifth of the cases, and aggressiveness, uncooperativeness and attention-seeking, which are seen less frequently.

INCIDENCE

One observer has stated that all children are faced with the problem of homesickness and that we are only aware of those children who as yet have been unable to reach a satisfactory solution. We see parts of this symptom complex, but it is not recognized as homesickness. It manifests itself as a mood or a reaction, expressed as disappointment or sadness, aroused by some known external cause, but in which the reaction has been set off within the child because the present set of circumstances had reactivated emotions belonging to some situation in the past.

It is certain that the amount of homesickness will vary with the degree of basic security in our homes and communities. Some children will be able to leave home with a feeling that they will return to it again and find it and their loved ones intact and happy. The more we are aware of the existence of these symptoms and their meanings, the more likely will we be able to recognize the problem or the potential problem.

A THEORETICAL CONCEPT

The symptoms of homesickness and depression become manifest when the dynamic organization of the psychophysical system can no longer cope with the environment. The unique home environment may frequently hide the pathological organization of the psychophysical system, and when the individual moves to a new environment, pathological symptoms may become apparent.

The symptoms previously referred to can be grouped in five categories: (1) psychosomatic; (2) suspicion and paranoia; (3) a feeling of loss; (4) avoidance reaction; (5) manic denial.

If we ask ourselves at what occasion in the emotional development of a child these symptoms may first appear, we are faced with the complex and controversial problem of personality development of the infant and toddler.

The views of Freud, Abraham, Rado, Helene Deutsch, Melanie Klein, Scott and Winnicott have been most useful in formulating the author's interpretation of infant development that leads to depression. Perhaps those of Winnicott[11] and Scott[9] will be most easily understood by those not familiar with psychoanalytic literature in general. The form the depression takes is a result of the natural history of the illness as the individual develops and matures.

The first interpersonal relationship experienced by the human being is the one which Winnicott[11] describes in the phrase—"mother holds a baby in a situation". The mother's ability to "hold a situation" for her baby will determine what kind of memories develop within the infant. In this mothering situation, the infant experiences feelings about clinging, contact, breathing air, sucking and taking in milk, passing urine and stool, moving his body and limbs, sleeping, space and time, over the period of his early development. If these experiences are gratifying, the infant experiences pleasure and builds up pleasant associations to these activities. If they are frustrating, the opposite occurs, and he builds up a store of associations which adults might refer to as angry feelings.

Through "the mother holding baby in a situation", an inner world of memories of objects, situations and associations is gradually built up, and only slowly does the infant develop a stable external world of perception that can be matched with a

stable internal world of memory. In early development, pleasant or angry activities can be directed towards the outer world or towards the inner world, and on this basis the frequency and kind of illness in infants may be explained. The interchange between the two worlds can be accomplished at this stage by breathing in, breathing out, swallowing in, vomiting out, holding in feces or urine or getting rid of them by diarrhea and frequency, and by dreaming. This may be one reason why dehydration can occur at this early stage more readily than at any other time in the natural history of the human being. The gravest emotional illnesses are initiated at this time if there is no mother holding the baby and the situation is frustrating. This part of infant development has been well documented by Goldfarb,[4] Spitz[10] and Bowlby.[2]

In the earlier forms the inner and outer worlds are made up of what are later called part objects—namely, nipples, fingers, breasts, hands, lips, eyes and faces. Only slowly does a "self" as a "whole person" or "other people" form. Along with this gradual increase in complexity of inner and outer object formation is a gradual increase in complexity of affect development. The simpler affects which adults call "good", "pleasurable", "gratifying", "satisfying", "loving", on the one hand, and "bad", "annoying", "angry", "painful", "raging", "hateful" or "fearful", on the other.

Sooner or later the infant develops sufficient integration, organization or synthesis to realize that memories of the loving, satisfying part of the mother and that memories of the opposite hateful, unsatisfying parts of the mother are parts of the same whole continuing mother. It is coincident with this integration of loving and hating that new emotional states can arise. To quote Scott: "The realization that maximal love and maximal hate can be expressed by the same bodily organs, that both maximal love and maximal hate can be felt towards the same object and that this object can be both satisfying and frustrating, or can appear to be both loving and hating" is the occasion for the earliest form of sadness, concern, loneliness and depression.

Tolerance of this new affect depends on what Klein describes as "the store of good things inside", and this depends on the quality of mothering experienced by the infant. Sadness and depression can be tolerated and not yielded to if the "store of good things" and "experiences" are sufficient and greater than the "store of bad things". Guilt is the anguish and self-blame felt by the dependent child when he experiences hateful and destructive urges towards the mother whom he loves and needs for his existence. Depression includes the guilt and confusion of such an occasion. Guilt, in contrast to fear and anxiety, is an accompaniment of sadness and depression because it requires the same degree of integration. Less overwhelming depression occurs as it is realized that the mother will not become non-loving and non-existent. The very important asset of how fast one can handle one's depressive feelings depends on how quickly one can realize that the loving forces stored within are stronger than the destructive ones. It is this state of affairs within the child which can lead to normal hope—to hope that all can be put right again—in other words, to mourning.

When the store of good things and bad things are in even or negative balance, and therefore depression cannot be tolerated, certain defensive mechanisms come into play. Helene Deutsch, in 1933, discussed both paranoia and mania as a defence against depression—the one regressive and the other progressive. The paranoia was related to projection on to the persecutor of "bad things" and mania to denial of depression. In a paper entitled 'Transitional objects and transitional phenomena" Winnicott introduced the concept of there being not only a double inner and outer world, but a third experience of something between. He refers to the common activity of blanket sucking and hair twisting, the little dirty teddy bear or piece of cloth that seems to comfort the child as he sinks into sleep. It is the author's understanding that this "in-between situation" can be resorted to as a substitute or as "mourning unsuccessfully", and that this type of activity can persist in children and adults for a long period of time, just as the psychosomatic, paranoid or manic defences can persist.

In questioning myself whether I had enough "good" knowledge of childhood depression within me to write this paper, I found myself spending quite a bit of time in "anxious thought-gathering". I didn't write; I brought experiences from within into contact with ideas I could find outside in literature and in talk with other people. Nothing was committed. It was a state of hope and hopelessness, concern and confidence. Some of us find it difficult to get beyond this "mental rumination" or "unsuccessful mourning" state. One wonders if this state is not related to Winnicott's "half-way-between station", and may be a regressive defence closely related to transitional objects and phenomena.

CASE HISTORY

This child attended camp at the ages of 8, 9 and 10 years. In the first year he was a bright child who needed to excel and liked to compete in situations where he could win, but he needed to be helped to develop a capacity to be a good loser and to share. He continually wore a parka, which he had on when he came to camp, and insisted on wearing it on the hottest of days and plucked the wool out of it at night during the first six weeks of the camping period. When his mother came to camp, he seemed to treat her as a stranger during the first few hours, and yet was extremely upset and cried profusely when she left.

During the second year it was reported that he was excessively talkative and seemed to dominate conversations. He brought a huge trunk and two duffle bags full

of equipment to camp, most of which was never used. Throughout the summer he seemed to be extremely active but did not seem to accomplish very much. He ate a lot and gained 8 lb. in eight weeks. His mother reported that many of the letters she had sent him—and she wrote every day— had been found unopened in his trunk on its return home.

The third summer he was accompanied by his younger brother because his parents were going to Europe. He spent much of his time checking up on what the younger brother was doing, and consequently did little in the company of his group. Our attention was drawn to this camper when he came to us 10 days before the end of camp, crying and upset and wanting to return home immediately. His parents had returned home from Europe and had called him by telephone to say that they would not be able to visit him for the weekend as they had promised, because they found so much to do at home on their return. The parents were contacted by telephone and it was confirmed that it was impossible for them to come, but they would come in a week if this was considered necessary.

The crying, hopeful sadness gave way to a feeling of hopelessness and a sense of being trapped. The suspicion was expressed to the effect that the physician wished to keep him at camp to obtain the camp fee, and that the camp was a prison and the doctor his gaoler. He tried in many ways to elicit the sympathy of other staff members to influence the physician or his parents. A day or two later he developed abdominal pains and a conviction that he had a hernia and later a sensation of not being able to get his breath and a fear that he had pneumonia.

Disturbances of this kind are not unfamiliar to camp directors, school principals and pediatric hospital personnel in the first few days of separation, but they are less commonly seen for the first time at the end of the third period of separation. In reviewing this case and subsequent follow-up in the light of our theoretical concept the dynamics of the situation seemed apparent.

His mother had been very tense and uncertain during the pregnancy and early development of this child. He had difficulties in feeding and retaining his formula, and both mother and child had had pneumonia in the first year of life. He had a blanket which he would not permit her to wash right up to the time he came to camp. The mothering situation during infancy had not been very adequate and therefore the store of good things was limited. He compensated by achievement and a need to win. He needed to use a "transitional object"—the parka—to defend against his inner angry and destructive objects. When his mother visited camp he showed how he used the camp "holding situation" by repressing his feelings towards his mother, and acted as if he did not recognize her on arrival, but had to raise a great disturbance when he felt abandoned on her departure.

The excessive chattering was his way of exaggerating his supply of good inner things. The excessive amount of equipment was the outside counterpart. The tremendous appetite and gaining of 8 lb. was storing up good things. Not opening and reading letters was an omission which helped him to deny the realization of his angry feelings at abandonment. His extreme activity or, perhaps more correctly, restlessness, was due to the manic denial of his depressive feelings.

In the third summer his interest and concern in the welfare of his little brother was an identification with the good mother figure and was necessary to tolerate the idea of his parents going off to Europe. The disappointment at his parents not visiting on their return, as promised, made his mental disturbance much more obvious. Up to this time he had not been considered as a problem and his activities were accepted as being normal variations for a child of his age. He had successfully defended against his intolerable depressive feelings. He could not tolerate the disappointment of his parents not visiting and depressive feelings flooded him. These were followed by more primitive defences against sadness and depression, and took the form of feelings of being persecuted by the physician. These feelings were followed by somatic complaints which probably developed as a result of feelings associated with infantile difficulties.

CONCLUSION

In the light of observations on childhood behaviour and outlined hypotheses on the infantile development of object relations and emotions, a description of a concept of depression and defences against depression in children has been given. It is suspected that such depression and defences are closely related to some of the adult depressive states but this paper does not contribute to the proof of this suspicion. Nevertheless, it is hoped that this report has contributed to a better understanding of some of the implications and complexities of the development of depressive states in both children and adults. It is suggested that children and their families be examined with these concepts in mind in the hope that our understanding of depressive states may be further improved.

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ORIGINAL ARTICLE

FAMILIAL DYSAUTONOMIA (RILEY-DAY SYNDROME)

REPORT OF TWO SIBLINGS AND A REVIEW OF THE LITERATURE*

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THIS STRANGE congenital disorder of the central nervous system was first recognized as a distinct clinical entity in 1949 by Riley *et al.*,[1] who published a preliminary report of five Jewish children with "central autonomic dysfunction and defective lacrimation". Recurrent episodes of high fever with hypertension and vomiting are its major features. The basic disorder appears to be a congenital dysfunction of the diencephalon. A few case reports had appeared before 1949 under different names. In all but one, the clinical findings furnished therein were incomplete and did not provide sufficient evidence to include them in this category. However, the case reported by Engel and Aring[2] in 1945 can be accepted as representative of this syndrome.

In 1952, Riley[3] reported a series of 33 cases which had been studied in detail. In this comprehensive report, all the major and minor diagnostic features of the disease were outlined (Tables I and II). "Familial dysautonomia" was suggested as a descriptive name for the condition. Several comprehensive articles by different authors have appeared subsequently.[4-11]

Autonomic dysfunction constitutes only a part of this syndrome. Evidence of widespread nervous and other systemic involvement is always present. As a rule, the disease manifests itself in infancy. Dysautonomia can exist in all grades of severity and it shows no predilection for either sex.

Over 80 cases of this syndrome have now been reported, the majority of them from the United States. The incidence of this disease in the siblings of affected children has been estimated at about 25%.[3]

It is the purpose of this paper to report two siblings with familial dysautonomia.

CASE REPORTS

CASE 1.—P.M., a 7½-year-old girl of Jewish parentage, was admitted to the Regina General Hospital on December 10, 1957, the chief complaint being of episodes of fever with vomiting.

She was born at full term on August 17, 1950, by breech delivery. Her mother had no illness during pregnancy; she was in labour for 30 hours. The child's birth weight was 7½ lb. There were no neonatal complications. She was breast-fed for three months but refused solids until the age of one year.

Strabismus was present from the time of birth. The parents had never seen tears in her eyes even when she cried. In infancy, she had been a "breath holder" and drooled a lot during the first six years of her life. Her tooth eruption was irregular. Her appetite was poor and she had difficulty in chewing foods. She sat up at 10 months, stood up at 16 months, walked at two years and did not talk in sentences until she was five years. Her gait was unsteady. Frequency of micturition and enuresis were troublesome. She was stubborn, nervous and easily excitable, with frequent temper outbursts. She perspired profusely and blushed whenever excited. She is now repeating grade one in school at the age of seven years.

One month before admission, she developed sudden high fever, diffuse abdominal pain, vomiting and urinary frequency. She was admitted to a country hospital where she improved after five days of supportive treatment.

Since the age of one year she had suffered recurring attacks of unexplained fever, abdominal cramps and vomiting. At first, the attacks came at intervals of four to five months and each lasted for about 24 hours. Recently the episodes had become more frequent, occurring every 15 to 20 days and lasting for three to five days. She was often constipated. During attacks, she demonstrated marked personality change. She became anxious and restless, and frequently rubbed her lower abdomen and external genitalia.

At 2½ years of age she was investigated, chiefly because of her delayed speech and unusual gait. The

TABLE I.—ALMOST CONSTANT FEATURES

Features	*Case 1*	*Case 2*
Defective lacrimation	4+*	3+
Cold hands and feet	4+	4+
Excessive perspiration	4+	4+
Postural hypotension	4+	0
Disturbed swallowing reflex	3+	2+
Poor motor co-ordination	4+	4+
Dysarthria	4+	4+
Relative indifference to pain	2+	2+
Emotional lability	4+	2+
Jewish extraction	4+	4+

*1+ to 4+ = degree of involvement.

TABLE II.—FREQUENT FEATURES

Features	*Case 1*	*Case 2*
Drooling beyond usual age	4+*	4+
Cyclic vomiting	4+	3+
Poor temperature control	4+	4+
Skin blotching with excitement	3+	2+
Episodic hypertension with excitement	4+	2+
Areflexia or hyporeflexia	4+	4+
Delayed motor development	4+	4+
Retardation of body growth	3+	0
Difficulty walking on heels	3+	0
Apparent mental retardation	3+	2+
Abnormal electroencephalogram	2+	0
Frequent bronchopneumonia	2+	3+
Breath-holding spells in infancy	2+	0
Corneal hypesthesia	2+	1+
Corneal ulceration	2+	0
Occurrence in siblings	2+	2+

*1+ to 4+ = degree of involvement

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chest and skull radiographs, pneumoencephalogram, cerebrospinal fluid examination, and colloidal gold, Kahn and tuberculin tests were all negative. A diagnosis of "cerebral palsy" was made by the attending physician. She suffered recurrent attacks of respiratory infection until the age of three years, when her tonsils and adenoids were removed. She subsequently improved in this respect. At the age of 3½ years her intelligence quotient was 60. At four years of age, she developed a corneal ulcer which healed very slowly.

Both parents are living and healthy. They are of Jewish extraction and were born in Israel. There is no consanguinity. One 5-year-old sister is healthy. One brother, 18 months old (Case 2), is affected by the same condition. The parents know of no other significant familial disorders including any condition resembling dysautonomia.

Physical examination.—On admission, the girl's temperature was 102.4° F., pulse 140/min. and respirations 22/min. She was small, thin, poorly nourished, anxious and restless (Fig. 1). She appeared dull mentally. Her weight was 37½ lb. (less than 3rd percentile), and she was 45 inches in height (3rd percentile). Her gait and movements were clumsy and awkward. She walked unsteadily on a broad base. Her speech was poorly organized and unintelligible.

She produced no tears. Alternating external strabismus, more marked in the left eye, was noted. A small corneal ulcer was present just below the pupil in both eyes. Corneal sensation was moderately impaired. Her pupils and fundi were normal. Her teeth were irregular, her tongue was geographic, and the palate high and arched. Her blood pressure in the supine position was 160/120 mm. Hg and while standing, it was 130/110 mm. Hg. Her hands and feet were cold in spite of the fever. All deep tendon reflexes were absent and plantar responses were flexor. Her motor power appeared to be decreased and motor co-ordination was poor. Her musculature was generally hypotonic. She could not stand on one leg with her eyes open. She could not walk on her heels. Both feet showed pes cavus. She was relatively insensitive to pain and permitted very firm pinching. Classical blotching of the skin and excessive sweating occurred after excitement. (See Tables I and II.)

Laboratory findings.—Her hemoglobin value was 12.7 g. % (82%). The total leukocyte and differential counts were normal. Her sedimentation rate was 52 mm. in 60 minutes. Urinalysis and urine culture were negative. The blood urea value was 54 mg. %. Serum electrolyte values were normal. A roentgenogram of the chest and an intravenous pyelogram showed no abnormalities. Her electroencephalogram showed one burst of fairly high voltage slow wave activity in spite of moderately heavy sedation with phenobarbital and chlorpromazine.

Subsequent course.—Treatment included bed rest and sedatives, 15 mg. promazine hydrochloride (Sparine) together with ½ grain of phenobarbital intramuscularly every four hours as necessary for vomiting and restlessness. She was also given generous amounts of fluids, both orally and parenterally. She was hyperactive and difficult to manage on the first day. Vomiting stopped on the same day and abdominal discomfort disappeared completely on the third day. She remained anorexic for a short period, but her appetite gradually returned to normal. Her temperature ranged from 99.6° F. to 102° F. until the sixth day, when it returned to normal without the administration of antipyretics or antibacterial agents.

Fig. 1.—Case 1, P.M., and her brother, B.M. (Case 2).

Psychological tests in February 1958 showed that she had a "high-grade mental defect". A repeat electroencephalogram in August 1958 showed an immature and rather bizarre tracing without suggestion of epileptic activity.

Following her first admission, she was readmitted to hospital over a dozen times with recurrent, identical episodes of fever, abdominal pain and vomiting. Sometimes her temperature would spike to 105° F. or 107° F. rectally. She has responded well to routine supportive treatment. Her parents have been taught to give her intramuscular sedation at the onset of an attack. Corneal ulceration has not recurred.

CASE 2.—B.M., an 18-month-old infant (brother of Case 1), was admitted to Regina General Hospital on April 16, 1959, with the chief complaint of "heavy breathing" for the previous three or four months.

He was born at full term on August 7, 1958, and weighed 9¾ lb. at birth. The pregnancy and delivery were normal. He was breast-fed for three weeks and then was bottle-fed. He sucked poorly and could take just a few sucks without being dyspneic. He first sat up alone at eight months.

Four months before admission to hospital, he developed a "cold". His breathing soon became heavy and "wheezy". He had previously suffered episodes of fever and vomiting. The wheezing spells would come

and go suddenly. For the preceding month, he had wheezed almost constantly. One month before admission, his temperature suddenly spiked to 104° F. and he was admitted to the local hospital for a two-week period. Half an hour after returning home he was wheezing again. There was no history of exposure to common allergens, and no exciting factors could be detected. Antibiotics provided no relief. He wheezed more while eating and crying. The parents had never seen tears in his eyes even while he was crying. There was also a history of excessive drooling and sweating.

Physical examination.—On admission, his temperature was 101.4° F. rectally and his weight was 20½ lb. (50th percentile). He was anxious, moderately dyspneic, with wheezy respirations, and was perspiring profusely. Respirations were 50 per minute. His eyes were moist, but no tears were seen while he cried. There was slight corneal hypesthesia but no ulceration. Pronounced bilateral expiratory wheezing was heard in the chest. His blood pressure was 80/40 mm. Hg. The testes were undescended. His hands and feet were cold. His muscles were hypotonic and no deep tendon reflexes were elicited. He showed intermittent generalized skin blotching when crying. Relative indifference to pain was also observed. (See Tables I and II.)

Laboratory findings.—On admission his hemoglobin value was 12.6 g. %. The total leukocyte count was 19,100 per c.mm. with a differential count of 53% neutrophils, 38% lymphocytes, 6% eosinophils and 3% monocytes. Urine was normal. Cultures of the nasopharynx (Auger suction) grew a coagulase-positive *Staphylococcus aureus*. The serum total protein value and albumin/globulin ratio were normal. His chest roentgenogram showed heavy markings in both lung fields.

Subsequent course.—Initial therapy included water mist inhalation, antibiotics, sedatives, adrenaline and aminophylline. His temperature ranged from 99° F. to 106° F. rectally. He vomited intermittently. His wheezing was always more pronounced while eating and during febrile periods. His extremities were bluish, mottled and cold, even at the height of his fever. Intermittent episodes of fever and vomiting persisted in spite of vigorous treatment. Scratch tests yielded no useful information. An elimination diet was also tried but had no effect on his wheezing. He was discharged on May 19, 1959, in improved condition.

The parents were advised to administer phenobarbital and phenothiazine hydrochloride at the beginning of an attack. Subsequently, he was re-admitted to hospital on three occasions, with high fever, vomiting and wheezing respirations. During these attacks, his temperature ranged between 96° F. and 107° F. rectally. Administration of antibiotics and antipyretics have had little effect. In spite of iron therapy, he has always shown a slight normochromic to hypochromic anemia with a hemoglobin value of 9.9 to 11 g. %. Reticulocyte counts have been normal. Stools were negative for occult blood and for parasitic ova. The sedimentation rate has varied from 65 to 70 mm. in one hour. His blood pressure has varied from 80/50 to 135/95 mm. Hg. However, postural hypotension has not been demonstrated in this patient.

A chest radiograph on September 20, 1959, revealed bilateral, hazy, hilar infiltrations. These were interpreted as "probably inflammatory changes". By November 26, 1959, there was clearing of the right upper lobe, but perihilar infiltrations were still present. Films in December 1959 and February 1960 showed little evidence of resolution of these infiltrations.

A psychological assessment in February 1960, when the child was 18 months, revealed his apparent mental age to be only 10 months. He could not crawl or stand up and could say only a few single words.

DISCUSSION

Case 1 manifests almost all of the classical features of this syndrome. It is apparent that she was affected by this disorder from infancy. As she has grown older, the severity of her affliction has increased, and periodic vomiting with fever has become more frequent and prolonged. Phenobarbital and chlorpromazine hydrochloride have been helpful in treating her attacks. She is mentally dull, emotionally labile and very dependent on her parents. The marked personality change which she demonstrated just before and during an attack was noted by Moloshok and Reuben[12] in most of their patients.

Case 2 has also manifested most of the symptoms and signs of familial dysautonomia. In addition to the usual features, sudden attacks of asthma-like wheezing occur without any known precipitating factor. No allergic basis which could account for these wheezing attacks has been established. There is no family history of allergy. Moseley and Moloshok[13] observed that 13 of a series of 20 patients had appreciable respiratory difficulty and manifested the sudden appearance of moist rales in the chest at the time of eating or after emotional upsets. Bronchopneumonia or "asthmatic type" bronchitis were often encountered, the pulmonary infiltrations tending to be chronic. According to these authors, pulmonary changes in familial dysautonomia are the result of bronchial hypersecretion and a variable element of bronchial spasm with or without secondary infection.

Kirkpatrick and Riley[14] detected radiological evidence of bronchopneumonia in 19 of 32 patients in whom a chest roentgenogram was clinically indicated. In 12 patients, a routine chest film was taken without special indication. Four of these patients showed pneumonic infiltrations. Three had equivocal findings. Most commonly, the changes consisted of patchy perihilar densities. The right upper lobe was the most frequently involved site. Nine patients, followed up from one to 32 months, showed no clearing. Aspiration appears to play a primary role in producing these changes.

The patient described by Engel and Aring[2] had attacks of bronchial asthma throughout his life until he died at the age of 17 years. His skin tests were positive for a great many foodstuffs, but no clinical evidence was found of a definite relationship between his asthmatic episodes and food. Autopsy revealed pneumonitis and markedly thickened bronchial walls infiltrated with lymphocytes and eosinophils. Thick, hyalinized basement mem-

branes were noted. These changes are also found in allergic bronchitis.

Hilger[15] expressed the opinion that allergic reactions and states of autonomic dysfunction have a common basis in that they can produce similar clinical symptoms by virtue of abnormal transudate formation. In patients with autonomic dysfunction, the deranged neurovascular mechanism leads to spasm of small vessels resulting in endothelial damage and leakage. This produces the same symptom-complex as allergic conditions.

Eczema and allergic rhinitis are also seen in some patients with dysautonomia. In 1957, Heiner and Blitzer[16] reported the case of a man and his two children who suffered from recurrent attacks of angioneurotic edema as well as from multiple symptoms of autonomic dysfunction. Two other members of the family were affected by the same condition. It is, therefore, conceivable that the autonomic nervous system may have some central role to play in defining allergic reactions.

As a rule, the affected infant presents with difficulty in feeding or "blue-spells" with recurrent bronchopneumonia. The full-blown picture is usually evident by the age of five.

Autonomic Disturbances

Episodes of unexplained high fever occur frequently. During the attacks, affected children exhibit wide fluctuations of body temperature which may range from 95° F. to 108° F. The response to antipyretics is not satisfactory, but sedatives often help to bring down the elevated temperature. The fever is usually associated with intractable vomiting. Some patients have died during an attack of fever and vomiting. Their death was not always related to the severity of dehydration or fever. Even in the presence of high fever, the patient's hands and feet remain cold because of vasoconstriction and impaired peripheral circulation.

The abnormal swallowing reflex presents a problem in infancy. The infant has difficulty in both sucking and swallowing. There is also excessive drooling which is believed to be due to the disturbed swallowing reflex.[6] This swallowing difficulty is more pronounced with solid foods and may result in the aspiration of food. The infant may have recurrent "blue-spells" or attacks of aspiration pneumonia. This is the commonest cause of death in infancy and early childhood. It was responsible for eight of 10 deaths reported by Riley.[3]

Hypertension with excitement is almost always present. The blood pressure rises during the attacks of vomiting. Intermittent hypertension may be confused with that of a pheochromocytoma, but the benzodioxane or Regitine test helps to differentiate these disorders. Nevertheless, at least five patients have been subjected to exploratory operation for suspected pheochromocytoma.[3] Persistent hypertension has not been reported in familial dysautonomia. Intermittent hypertension may, however, cause renal damage. In one patient who died of azotemia, nephrosclerosis was found at autopsy.[6] Another possible complication of hypertension is the occurrence of sudden massive hematemesis and death. One patient who suffered recurrent episodes of hematemesis and melena died at 3½ years of age. Postmortem examination failed to reveal any evidence of a gastrointestinal ulcer.[17]

Postural hypotension can be demonstrated in most patients beyond two years of age. In some cases, hypotension on standing may be so marked as to give rise to "blackout spells".[13]

Other Neurological Manifestations

Evidence of involvement of both motor and sensory nervous systems can be found in the great majority of cases. The most constant of these abnormalities are absent or diminished deep tendon reflexes, difficulty in motor co-ordination and relative indifference to pain. Development is delayed. The patient has difficulty in walking on his heels. The gait is awkward and unsteady. Poor motor co-ordination also gives rise to dysarthria. Speech, particularly articulation, is slow to develop. Scoliosis and pes cavus are seen in some affected patients and are thought to be the result of muscular imbalance. In one case, signs of involvement of pyramidal tracts were also present.[18] Minor trauma does not seem to cause much pain, although these children have normal tactile sensation. In one child, a fracture of the humerus went unnoticed until months later when it was detected on radiographic examination.[19] The electroencephalogram commonly shows a moderate dysrhythmia of the type associated with idiopathic convulsive disorders. Breath-holding spells, sometimes followed by convulsions, are occasionally seen in affected infants.

Psychological Changes

Freedman *et al.*[11] have reported in detail the psychiatric aspects of familial dysautonomia. Based on their study of 14 patients, they consider that the brain disorder disturbs autonomic and emotional balance, giving rise to various psychological problems. These children behave like individuals suffering from a diffuse organic disorder of the brain. They are very labile, anxious, restless and impulsive. They overreact to minor emotion-producing stimuli and have frequent temper outbursts. Their adaptation to new situations is very poor. Parents of affected children harbour anxiety, resentment and guilt, and this starts a vicious circle.

Because of poor motor co-ordination and speech difficulties, these children appear to be mentally retarded, although their intellectual capacity may be normal. Sudden personality change or psychotic behaviour during "attacks" occurs frequently.[13] Self-destruction may be attempted.

OCULAR MANIFESTATIONS

Defective lacrimation and corneal hypesthesia are the most constant eye findings. Tears are usually absent. The eyes may be moist and the conjunctiva does not lose its normal lustre. The absence of tears can be ascertained after eight to 12 weeks of life when the normal secretion of tears begins in an infant. Even pungent odours, various irritants or blockage of the stellate ganglion fails to produce tears in these patients. Lacrimal glands were biopsied in two patients, but no pathological changes were seen.[19] In a study of three patients in 1956, Kroop[20] demonstrated the production of tears with a subcutaneous injection of acetyl B-methylcholine (Mecholyl). He suggested that there was a defect in the chemical transmission of impulses at the synapses of the parasympathetic efferent pathways.

Liebman[21] found varying degrees of corneal involvement in 10 of 19 patients studied. Three had corneal ulcers resembling severe neuroparalytic keratitis. Seven had minimal superficial scarring in the lower one-third of the cornea as seen in exposure keratitis. Corneal hypesthesia and diminished tear production, along with general dehydration, exposure of the cornea during sleep and possible trophic changes, all contribute to the development of this corneal pathology. The disappearance of corneal hypesthesia in two patients in their later teens has been reported.

Such corneal ulcers are very slow to heal in spite of vigorous treatment. Perforation has been reported in some cases while under treatment.[22] The instillation of 0.33% methylcellulose drops in the daytime and a bland eye ointment at night has been advised. Tarsorrhaphy for a period of at least six months is imperative for those with severe corneal ulceration.

MISCELLANEOUS FEATURES

Retardation of body growth is frequently observed. In one reported study of 47 cases, 27 fell below the average in height and weight. Not one was above the mean.[5] In a skeletal survey of 16 children with familial dysautonomia, delayed skeletal maturation was evident in seven patients.[14]

The habit of constant thumb sucking and severe tongue biting has been described in a few cases.[24] One child chewed up more than half his tongue in spite of all preventive devices. Extraction of his teeth had to be carried out.[6]

ASSOCIATED CONGENITAL ANOMALIES

An increased incidence of various anomalies have been reported in association with familial dysautonomia. These include craniofacial disproportion with a large and dolichocephalic cranium;[1] plagiocephaly and asymmetrical ears;[25] undescended testes, delayed puberty, genital and prostatic infantilism, clubbing of fingers, dwarfism;[2, 17] hydrocephalus;[5] congenital heart disease, congenital dislocation of the hip, ischemic necrosis of the femoral head;[14] hyperextensible joints;[23] bilateral double renal pelves and ureters;[26] and megacolon.[23]

The autopsy of a 17¾-year-old boy, symmetrically dwarfed with underdeveloped genitalia and undifferentiated secondary sex characters, showed a normal pituitary gland.[2] Bone maturation in this case was normal.

ETIOLOGY AND PATHOGENESIS

The disease is hereditary and is transmitted by an autosomal recessive mechanism. Jewish children are affected almost exclusively, but five non-Jewish cases have been reported.[6, 27] The non-Jewish patients manifest a less severe form of the disease, and none of their siblings have shown the disease.

Only three of the 13 patients examined post mortem showed lesions in the nervous system.[6] The patient reported by Engel and Aring[2] had a small thalamic cyst. The other two had unrelated multiple brain abscesses and degeneration of the reticulum of the pons and medulla respectively.[6, 17] No other pertinent pathological changes in the central nervous system were found.

The disorder is probably best explained by a congenitally defective enzyme system or central transmitter substance. This leads to distortion but not complete disruption of function of the affected neurons. Baxter[28] believes that dysautonomia and congenital universal insensitivity to pain may have a similar pathogenesis.

Riley[6] considers that the disease is of genetic origin, and that its basic cause might be an enzymatic disturbance in the nervous system. Linde[30] suggested that a developmental error can produce the same effects.[29] The nature of this enzymatic or developmental defect is unknown.

DIAGNOSIS

The diagnosis is frequently overlooked. A definite diagnosis has been made at the age of 3½ months in the absence of a family history of the disease.[31] No laboratory test is available to establish a definite diagnosis. Early detection of the disorder can prevent multiple unnecessary diagnostic procedures. The diagnosis is facilitated by the history of another affected individual in the same family or kinship.

PROGNOSIS

Life expectancy is definitely reduced in familial dysautonomia. In Riley's last report in 1957,[6] 15 of 69 patients had died and the oldest patient was 23 years of age. The causes of death, in order of frequency, have been aspiration pneumonia, hyperpyrexia, vomiting, convulsions with subsequent coma, sudden massive hematemesis and uremia.

Patients with familial dysautonomia are also very poor anesthetic risks. They are prone to sudden severe hypotension, cardiac arrest and postoperative bronchopneumonia. When operation is neces-

sary, local anesthesia should be used whenever possible.

With our present knowledge of this disease, the prognosis and natural evolution of the disease cannot be altered a great deal, even with early diagnosis.

TREATMENT

In familial dysautonomia, various drugs and surgical procedures have been tried, but none have produced lasting benefit. Lumbar sympathectomy, prefrontal lobotomy and splitting of the tentorium cerebelli have been performed in each of three patients with unsatisfactory results in all.

The best that can be offered these patients at present is symptomatic medical treatment. Sedatives and tranquillizers have been of great help in controlling the unpleasant symptoms of the "attacks". Chlorpromazine hydrochloride (Largactil) and promazine hydrochloride (Sparine), either alone or in combination with phenobarbital, have consistently given gratifying results. Psychotherapy and, in particular, group therapy are helpful in some cases.

SUMMARY

The case histories of two siblings with familial dysautonomia are presented. Jewish children are almost exclusively affected by this rare disease. Recurrent episodes of high fever with vomiting and prostration are its most outstanding features. Perspiration is excessive, but no tears are produced.

Severe respiratory distress with asthma-like wheezing is rather unusual in this condition. However, the second patient described in this report is quite handicapped by this condition. Rather extensive hilar infiltrations accompany these chest symptoms.

Sedation and general supportive measures are the most important part of treatment. Chlorpromazine and related substances provide the greatest relief. The severity of spells may diminish with age but life expectancy is limited.

We would like to express our appreciation to Drs. D. Baxter, D. Rodger and A. J. Longmore for their constructive suggestions.

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PAGES OUT OF THE PAST: FROM THE JOURNAL OF FIFTY YEARS AGO

SOCIAL PROBLEMS IN RELATION TO MEDICINE

Several years ago Dr. Richard Cabot, physician-philanthropist of Boston, realized what becomes apparent to us all, after some years of medical practice; namely, the limitations of the pharmacopœia in medicine, and that even the healing of the operation wound in surgery is often merely the beginning of a long process of repair, requiring for its continued progress conditions which originally must have been natural accompaniments of the creation of human life, but which are so often absent in our large cities, and which are certainly non-existent, in some form or other, in the case of the poor and maimed, who make up our present-day hospital patients. Such conditions, it is hardly necessary to add, are an abundance of good food, sunshine, and fresh air, as well as livable social and hygienic conditions. The fact was therefore forced upon Dr. Cabot that, while the outpatient department is the best means at our command for diagnosing disease, in the case of many conditions such as tuberculosis, malnutrition, dyspepsia, neurasthenia, varicose ulcer, heart, and joint diseases, the cure has come to mean, largely, education, prevention, and financial help. Moreover, the home conditions must be studied, in so far as they may bear on the causation of the maladies in question; and it is in relation to the social aspect of the case that the outpatient department has been found deficient, for the hospital physician has no time to visit the homes of public hospital patients. In order that this may be done systematically, social workers are required; hence, the Boston Social Service Department was organized with headquarters in the large, sunny corridor on the main floor of the outpatient department of the Massachusetts General Hospital.

The organization of this department is as systematic as that of any other outdoor clinic. All cases which do not seem to be absolutely disposed of by prescription or other form of treatment, surgical or otherwise, under the personal direction of the physician in charge, are referred to the social clinic, in the same way as a nervous or ophthalmic case is referred to the neurological or ophthalmological clinic. Social Service reference slips are therefore supplied, in which the physician writes the medical diagnosis, with his reason for so referring the patient. In this connection, it may be mentioned that these workers are in direct cooperation with the Boston Bureau of Information of Associated Charities, where the names of all patients who come to them are registered, with pertinent details. The object of this procedure is two-fold: first, it affords ready, though strictly confidential, reference when necessary; secondly, it avoids loss of energy and clashing of efforts by eliminating duplication. Another invaluable aid is the "Directory of Charitable and Beneficent Organizations," a book of nearly five hundred pages, affording an easy means of ascertaining the resources of the community. — Richard Monahan, *Canadian Medical Association Journal*, 1: 337, April 1911.

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SPECIAL ARTICLE

HAZARDS AND HINDRANCES IN PSYCHIATRIC RESEARCH*

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THERE IS a widespread feeling that research in psychiatry is not proceeding with the assurance and certainty which marks many fields of medical investigation. While there is no doubt about the importance and urgency of the issues to be solved, the very nature of the material makes it difficult to posit precise problems, a somewhat helpful preliminary to a scientific approach. There is, in addition, something less than clarity about the most appropriate means which should be employed in attacking these problems. The very nebulousness of the huge front to be attacked is formidable, and recognition that techniques of the basic sciences have not been found to be as fruitful as in the study of problems in clinical medicine, for example, is disconcerting. This is perhaps particularly so since psychiatry is generally thought of as a branch of medicine and susceptible to similar methods of study. This may be, in part, a misconception which impedes the growth of knowledge, research and understanding in this field. While it is true that techniques singular to psychiatry have been developed, most leave something to be desired in terms of ease of applicability and validation.

Criticism has been levelled at psychiatrists because they do not use or do not have criteria of the same rigorousness as other branches of science. There are some legitimate reasons for this state of affairs which cannot all be considered here, but it may be remarked that the practice of medicine proceeded happily with the aid of such honourable techniques as percussion and auscultation when the only validation was that of experience, which present-day skeptics might term "impressionistic appraisal". The time had not come, as it now has, when demands for the objective estimate of error of a method are made. In that respect, psychiatry is being subjected to a more exacting scrutiny than medicine ever underwent until recently.

The number of psychiatrists doing research was until very recently lamentably small. This depends on the historical time of development of psychiatry which took place more than a century after medicine.[1] Advances which have occurred in psychiatry have been the result of the diligent efforts of a few, and there have been no basic sciences as in medicine upon which psychiatry depends and in which its tyros could be nurtured. These are growing now—neurophysiology, biochemistry, psychology, sociology and anthropology—but they do not offer the indubitably appropriate training for psychiatric research that biochemistry or physiology offers to the neophyte in the field of clinical investigation in medicine. This means that the psychiatrist, in doing research, is at a considerable disadvantage to the internist, who has only had to extend his knowledge of those techniques which he learned as an undergraduate in order to undertake physiological or chemical investigations in the clinic. While the latter has had to invoke the assistance of electronics technicians and others, as the physician in charge of the patients he has been able to guide the direction in which the research has gone. In this way he has maintained, and actually improved, his own status. It is true that a psychiatrist may do research using the techniques of biochemistry or neurophysiology, but these techniques are appropriate to a much smaller part of the psychiatric field than they are in medicine. For a more comprehensive approach in psychiatry, mastery of one or other of the disciplines of the social sciences is essential. Few psychiatrists have anything but the most vestigial of trainings in these areas. Admittedly, some have been able, by dint of their own industry and curiosity, to master enough information in the social sciences to make use of these techniques in their research projects.

A discussion of the factors of importance to the development of research in psychiatry involves many issues, some of which will now be considered.

1. *Attitude*

In medical research which concerns patients, the model elected has been that of the basic sciences in which the observer endeavours to neutralize his role so that he stands outside the situation and records or manipulates in an impersonal way. The aim is to get data which are repeatable, and can be communicated to non-participants. Some of the difficulties involved in this orientation have been wisely discussed by the late Sir Thomas Lewis,[2] one of whose articles has been abstracted in the accompanying table (Table I). While this approach may be utilized in a limited way in psychiatric research, in those types of investigation whose sole approach employs the methods of the basic sciences, it leaves major areas of psychiatric study untapped. In any endeavour to get at an expression and understanding of feelings and ideas of a patient, the psychiatrist becomes a participant observer. Rioch[3] has pointed out that the Newtonian approach dispensing with the observer was suitable for the dehumanization of the industrial revolution, but a change in outlook derived from Darwin, Marx and Clerk Maxwell with the introduction of the concept of mechanism with a purpose. As a

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result of the efforts of Mach and Einstein, laws ceased to be viewed as immutable and the observer was brought back. It was inevitable that this humanization in physics should spread most logically to psychiatry. Though others doubtless preceded him in this perception, no one recognized and described the role of the psychiatrist as participant observer better than Sullivan. His contributions in this and other respects have been critically reviewed by Harris,[4] who points out that Sullivan's previous training in physics influenced his definition of psychiatry as the study of "interpersonal process", and probably prevented him from utilizing those mental processes such as desires, needs, values and motives which are of considerable importance to the self, particularly in a reflective mood away from the maddening crowd of interpersonal relations.

interpersonal processes are the object of concern, has been made recently by Wiedorn[8] in a discussion of the implications of these issues for the philosophy of science. He says that "a science of psychiatry is concerned with the manner of distortions of ways of living and being in men interrelating; in contradistinction to statistics, physiology, biochemistry, etc., applied to elements or events appearing in persons experiencing distortions of ways of living and being." The author of this important paper stresses the fact that the responsibility of the investigator studying psychodynamic processes is greater than in purely therapeutic situations because one has then both scientific and therapeutic responsibilities. He indicates his belief that criteria for science need not be limited to concepts derived from a physical model and that though data susceptible to conventional methods of control, repeatability and validity may not be gathered, the methods yield information capable of subsequent codification and verification. Undoubtedly much remains to be learned about the means of gathering data in clinical psychiatric research and of assessing the relative significance of changes in what Wiedorn calls participant systems sciences.

TABLE I.—DIFFERENCE BETWEEN DIAGNOSTICALLY ORIENTED THERAPIST AND INVESTIGATOR

Therapist		*Investigator*
1. Goes forward to recognize the known.	—	Goes to face the unknown.
2. Deals with the individual.	—	Collective in outlook.
3. Samaritanism ever present.	—	Remote.
4. Repeats and is to that extent sterile.	—	Must be original.
5. Mistakes unavoidable, affect career little.	—	Mistake early in project destructive.
6. Destructive to consecutive thought.	—	Consecutive thought essential.
7. Confidence breeds faith and hope.	—	Diffidence breeds inquiry.
8. Companion of confidence is uncritical acceptance of alleged facts and hypotheses.	—	Companion of diffidence is scepticism.

(after Sir Thomas Lewis)

Several other groups of workers have studied this process and have shown how necessary it is to consider the observer and his significance to, and even his reactions in, a situation which is far from impersonal. Reiser *et al.*[5] found that the status of the examiner had an influence on cardiovascular responses of normal young men in a mildly stressful interview situation. Greenblatt and his colleagues[6] found a highly significant correlation between the therapist and patient's reactions in an interview situation in which physiological as well as psychological data were recorded and studied. Heart rate changes with anxiety and depression varied in the same direction in both subjects except when the therapist's relationship was disturbed by extra therapeutic concerns or negative counter-transference feelings. Malmo, Boag and Smith[7] recorded heart rate and muscle potentials from the neck and speech muscles in psychoneurotic subjects and the psychiatric interviewer. Differential physiological reactions occurred to supportive and threatening situations in both patients and examiners. Praise led to a fall and criticism by the examiner led to an increase in speech muscle tension in both observer and observed. The patient's heart rate rose more on the examiner's so-called "bad days". This type of work when extended should throw considerable light on many of the processes taking place in a variety of situations where communication is vital.

A comparison of the methods of data gathering in the physical sciences and in psychiatry, where

2. *Environment*

The culture of the community in which the investigator develops and lives has considerable influence on his evolution. Ruesch[9] has discussed this with considerable incisiveness, pointing out that in Europe there are many lines of recognized and rewarding endeavour, each with its parallel status hierarchy, but in the United States and Canada, it may be added, the two status hierarchies which have most influence are power and money, and they are interchangeable. The public which regards success in terms of money or power looks askance at the academic life which it regards as a refuge for those incapable of earning a living outside ivory towers. In nations where there exists a powerful bureaucracy, Ruesch adds, there is both temptation and pressure to participate in association offices, committees and various agencies, till a promising young man loses contact with investigative or therapeutic work. This means that many of the top men in professional fields are administrators and not students, and to them the students will look, though in truth it is only from scholars

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that they can gain knowledge and the necessary skills. Although bureaucrats may mouth homilies about the importance of research, this does not constitute inspiration for students or residents.

An institution can flourish as a research centre only if many of its senior men both like and do research themselves. The combination of cultural complexities which favour research are involved. Gates,[10] in discussing basic research in Europe, concluded that the most stimulating climate for research existed in Britain, which he takes as evidence of good organization and a sound educational system. The famous long weekends and generous tea hour doubtless provide more opportunity for contemplation and discussion, but probably of greater fundamental importance is the attitude of toleration of the deviant individual which goes with a respect for personal liberty. This allows "characters" to flourish and favours original and different points of view. This stimulates research ideas, just as slavish conformity and fear of authority inhibits them. This is particularly true for the social sciences which impinge on the sacred cows of any culture.

3. *Support*

The financial rewards for research workers in the medical and social sciences are still, as for university teachers, grossly inadequate in comparison with the remunerations of private practice or the business world. This is, of course, related to the cultural values already referred to, but it is a matter of serious import if one subscribes to the belief that academically inclined persons are of fundamental value to the community at large. Ruesch gives figures which indicate the seriousness of the sacrifice which must be made to undertake an academic or research career. The sacrifices generally fall on the family and not the worker himself. Recently government agencies and foundations have started to upgrade the incomes available, but some of those responsible for financial policies have endured the penurious school of university stipends of earlier times and in the rigidity of their declining maturity perceive no reason why the young should prosper better than they. Forgotten are the facts that the young are no longer nurtured on fantasies of a better world and the wisdom of their elders. These happy dreams were shattered by contemporary history. Simultaneously the customs of earlier marriage and more prolonged education in preparation for professional endeavours increased the need for a living wage until such time as a relatively adequate income became possible with the achievement of specialist qualification. If the best talent is to be attracted and held in research activity, the financial gap between the rewards of private practice and investigation must also be narrowed. It is furthermore a competition not only with financial returns but with the narcissistic satisfactions of dealing with patients, a matter of even greater weight in psychiatry than medicine.

The actual amount of support for research programs has within recent years improved, but much less in Canada than in the United States. Unfortunately, the type of project research, so popular in wartime and profitable for limited practical objectives, is stultifying in many ways. It implies that teams work better than individuals and that science can be blast-fed to produce results. This does not help the creation of new ideas, as these come from individuals and not groups. This type of organization, depending as it does on clever application write-ups and time-consuming reports, involves the scientist in many wasted days and puts a premium on application-manship, a form of literary energy output that might better be allowed to incubate till it could be applied to the writing up of scientific results. Since most projects are in point of fact merely expressions of pious intentions of the direction in which the researcher wishes to go, they are often too rigid. Fortunately, the National Institutes of Health of the United States have shown a lead in recognizing this and permit a grantee the latitude to take off in an unanticipated and fruitful direction if results of the work indicate that such a deviation would be advantageous.

One of the most serious and disturbing of the present methods of financing is the limited period of support granted investigators. Grants which may be terminated at the end of a year, or even two or three, provoke a recurrent anxiety, even if the granting bodies in their wisdom and munificence see fit to extend the bounty. The net result is intolerable bouts of uncertainty that are threatening to the serenity necessary to good research and devastating to the security of dependents. The necessity to present yearly or even more frequent reports to justify the work is apt to turn the grantees into supplicants and hyperbolic special pleaders. This is good neither for the soul nor for science. Most workers publish their results and these are reported scrupulously almost without exception. This should satisfy the bureaucrats for whom it must be said in extenuation that they have boards or committees to whom they must report and from whom they must extract funds. As a rule these bodies are not as representative of academic thought as universities or as close to the workers expending the funds over which they preside. Fortunately, there are growing indications that the man rather than the project should be supported. Let us hope that this attitude spreads. At present psychiatry needs trained investigators and since few present undergraduate or residency programs produce such persons, an examination as to how they may be produced is in order.

4. *Training*

Organized training for research in psychiatry does not exist in the same way that courses are provided in the basic or applied sciences for train-

ing in research in clinical medicine. This has been discussed at some length in a most penetrating and constructive fashion by Ruesch.[11] A few resourceful psychiatrists have, by dint of their own efforts, acquired the added skills necessary to undertake and execute valuable research. To depend on such fortuitous occurrences would appear to be folly when there is now a demand and growing opportunity for individuals who can conduct and direct psychiatric research. How best to train for research in psychiatry is a problem dependent in large measure on the present state of conflicting theories and lack of conciseness about many aspects of this field. There is probably no one answer, but a basic premise would seem to be that early exposure to critical evaluation of information and the encouragement of curiosity is essential. In order to facilitate such a situation, a number of medical schools have encouraged student participation in research and this has been furthered by the support provided by certain forward-looking foundations, such as the Foundations' Fund for Research in Psychiatry. According to the schemes being tried out at various medical schools, students have been variously apprenticed to basic science departments associated with departments of psychiatry or to research workers in departments of psychiatry. My experience has been with the former and it has been extremely happy.

These young men soon enter into the spirit of the work, learn rapidly and perform a useful function, doing skilled analyses after a few weeks. They live in a scientific atmosphere and catch something of the spirit of adventure as well as the critical approach. Lhamon and Holmes, at the 1958 American Psychiatric Association round table meeting on "The Place of Research in Student and Resident Training", spoke equally enthusiastically on the spirit of participation and the excellence of results turned out by these novices. How many will go on to incorporate these benefits if and when they study psychiatry remains to be seen, but the current impression is that research in the basic sciences, if undertaken in or adjacent to psychiatric wards, instills the student with the feeling that psychiatry is not entirely remote from other sciences and some of the aura of mysticism concerning this specialty is dispelled. Exposure to research in psychology has provided a lasting stimulation for some. Experience in sociological or anthropological investigations may be equally of value, but opportunities seem currently to be less available.

More extensive research training after college may be the course of choice in some instances, such as the taking of a higher degree in physiology, psychology or sociology. It would seem to be a case of "just as the twig is bent the tree's inclined", for the acquisition before medical school of some special research skill does appear to incline the man so trained to resume research once his psychiatric residency is finished. This implies that the psychiatric investigator needs to be master of a second discipline unless he is going to exploit his clinical or psychotherapeutic skills for research purposes. Not many are sufficiently disciplined to do this fruitfully. Actually the acquisition of psychotherapeutic skill requires as much, if not more, time in terms of study and experience as the acquisition of a utilizable quota of research orientation in neurophysiology, psychology, sociology, genetics or other pertinent fields. The orientation to therapy often precludes critical appraisal, but the necessity is becoming more apparent.

The training of the psychiatrist is both longer and embraces more data than that of the student of basic sciences proceeding to a Ph.D. The latter proceeds in a direct line after taking his B.A. or B.Sc., to his Master's degree and Ph.D., by which time he is approaching the limits of knowledge in the aspect of the field he is studying. The psychiatrist in training, on the other hand, suffers demotions at the end of his college career on starting medical school and on going into residency that are unavoidable but constitute rather harsh devaluations which may even be accompanied by depressions. At the end of residency he is not so near the limits of knowledge in his field and requires further study to enable him to be well enough informed to undertake comprehensive investigation. Fig. 1 has been designed to illustrate these points.

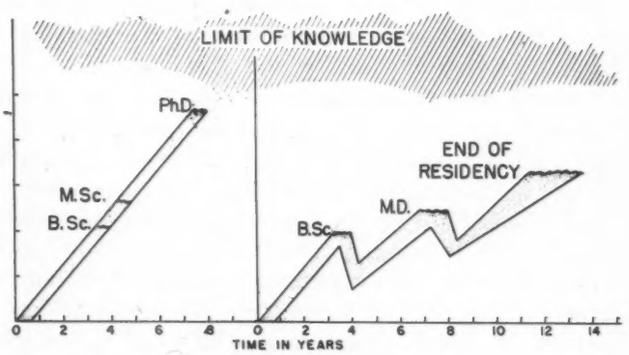

Fig. 1

The fact that few residents develop research interest has been remarked on by Finesinger[12] and others. They become therapeutically involved with their patients and are not sufficiently free of anxiety to step back and survey what is going on in a detached fashion. The narcissistic satisfactions of the therapeutic role stultifies at first and this may be a perpetuated process. Certainly a research climate is stimulating for residents, but few can mix research with all the other techniques and new information that need to be mastered, to say nothing of the time-consuming nature of their clinical obligations. Kubie[13] feels that there are actually considerable hazards in what he terms the premature plunging into research. Briefly, these consist of the necessity for the trainee to swallow large portions of working hypotheses, blind faith

in techniques he has no time or skill to question, and over-identification with the prejudices and biases of the older men for whom he works. Research, he feels, is for the psychologically mature. There are contrary opinions: and certainly for some productive workers, research is a refuge from personal contact.

The psychiatric investigator who is going to be involved chiefly with the psychological aspect of patients must have sufficient training and experience in psychodynamics so that his anxiety in dealing with patients is manageable. As Rioch[3] points out, one method by which this may be achieved is by the process of establishing belongingness in a group. An inherent danger in the acquisition of this kind of armour is that the group may be too restricted and limited by an esoteric vocabulary and assumptions. This makes it difficult for the investigator to consider alternative explanations couched in the language of another group or discipline, yet this is essential. Rioch goes on in this paper to discuss the necessity of the psychiatric investigator performing two functions sequentially, namely that of being a participant observer during the interaction with the subject and subsequently a critic of the data emerging. This implies a detailed study of verbal communication, about which much is being written these days. The psychoanalyst has a constant role as investigator and is bringing his knowledge and methods more and more into the orbit of objective scrutiny. For those who doubt, examination of Colby's recent book[14] should be both instructive and revealing.

The lack of psychiatrists trained in the social sciences constitutes a considerable void. This has been filled by social scientists who have contributed much to psychiatric knowledge by their efforts. This presents a problem for those concerned with psychiatric research. According to Ruesch[9] and verified by my own experience passing on applications for support of research in the field of psychiatry, it appears that some 80% of the work which is being done in the field of psychiatry is being undertaken by individuals not holding an M.D. degree. Obviously, such workers are doing much to advance knowledge which will be only favourable to the main issues of psychiatry, but if this process were to extend, one might find investigation in psychiatry being confined almost wholly to those with little clinical familiarity with it. Such a situation could lead only to a decline in the status of the psychiatrist, a situation which must be prevented or in the long run the quality of the doctor-patient relationship will decline. This concern about status is not an idle manifestation of narcissism, but one closely associated with the progress of research and of humanism. Field[15] has shown by his studies of the status of the physician in Russia that it is associated with de-individualization, partly planned and partly unconscious. There, the status of the physician has most certainly declined. Apparently it is necessary for individualism to flourish in order to protect the cradle of ideas, for to stamp it out only guarantees a pre-ordained course in which mediocrity flourishes.

It is not surprising in view of the fact that psychiatry embraces many disciplines that there is considerable disagreement as to what is basic and essential information and what belongs to the ever-expanding front. In other words, the criteria as to what the student should know are less widely accepted than for other specialties, such as medicine and surgery. This makes for grave difficulties in laying down requirements for the research student.

5. *Investigator*

It is frequently said that psychiatry does not draw its fair quota of able young men into its clinical, much less into its investigative ranks. This depends in part on the fundamental aversion to studying mental illness as a natural phenomenon. Implicit in the study of psychiatry is the wellnigh unavoidable obligation to look at one's own aberrant psychological processes. This is not a very palatable undertaking and hence there is a great tendency to avoid such a nebulous and threatening task, and a strong countercurrent to join the ranks of more firmly established specialties. Furthermore, it is bad enough to adjust oneself to the fluid vagaries of the emotional fluctuation of psychiatric patients and oneself, but to try to see these as themes for investigative appraisal requires entertaining still another risk.

The need for emotional maturity in the scientist has been discussed by Kubie in two stimulating and forceful articles.[16] Amongst other things, he emphasizes the importance of choice of career and distortions which neurotic personality organization may have on the selection of problem and conduct of the work. Ruesch feels that stability is of particular importance to the psychiatric investigator, a point of view Rioch supports in speaking of the training which is necessary to make mastery of anxiety in the therapeutic situation possible.

The psychodynamics of the research worker in psychiatry have recently been described in some detail by Denber.[17] He points out that variation in prejudice and preconception are seen in the various attitudes to the new drugs. Opinions range all the way from unrestricted enthusiasm to total derogation. This Denber compares to the counter-transference phenomenon, the experiment being the object. This supports Kubie's contention that "the greatest technical hazard is the distortion of the very thing that we are observing."[13] This process is probably more frequent and easier to succumb to in psychiatry than in the sciences where the observer is less of a participant and the behaviour of the object of study does not so readily strike a resonant or dissonant note in his emotions. Research has always attracted more than its share of deviant personalities: and psychiatry, too, perhaps more than other specialties. With the increase of

status accorded the research worker and of respectability to psychiatry, the incidence of deviants may decrease, but they will always be with us and must be tolerated, for from their ranks come brilliant contributions. The assets of the deviant have been elaborated by Hebb[18] in a paper of great importance on the topic "Education for Research in Psychology". It applies with equal force to psychiatrists.

The studies of Anne Roe[19] on the personality and personal histories of prominent men active in research represents the initial tapping of a fruitful source of information, as Kubie[16] and, later, Brosin[20] have pointed out. In Romano's incisive discussion[21] of this lucid paper, it is noted that only 5 persons in the last 100 years have made the inductive leap, creating new concepts of significance in terms beyond classical theory and their respective disciplines. These were: Darwin, Pasteur, Maxwell, Einstein and Freud. This prompts the question: What are we asking of our investigators? The answer surely is that they busy themselves with the study of problems pertinent to man. It is to be hoped that most of them should have fruitful and stimulating years furthering scholarship, but that only a few can be expected to add materially to knowledge. Small success, and even bitter failure, is in store for research workers, but out of their increased numbers should come a more comprehensive and solidly based psychiatry, and maybe one or two who, by the inductive leap, may push our science ahead another significant step.

There are dangers for the young investigator in training, as both Finesinger and Rioch have pointed out. He is exposed to groups, each limited by its special language, and divergence from the assumptions implicit in the language may be threatening to the more orthodox of the group. Since students identify with teachers, they are unlikely to veer away from the precepts of those who instruct them. Fortunately, psychoanalysis is showing a flexibility and welcoming attitude in this regard, as some of its leaders, such as Bowlby,[22] show interest in such new and fruitful fields as ethology. A research conference sponsored by the American Psychiatric Association on "Application of Basic Science Techniques in Psychiatry", held in 1956, indicates that both laboratory scientists and psychoanalysts can meet, understand and profit mutually. Such would have been impossible ten years earlier. This meeting was summarized by a philosopher, Dr. Abraham Kaplan, who stressed the need for "tolerance of ambiguity" in science.[23] His brilliant and witty epitome should be required reading for all psychiatric investigators, particularly for those who are apt to see psychiatric research in the mould of nineteenth century mechanistic proprieties and for those gentler souls who delight in the wisdom of suspended judgment.

6. *Auxiliary Investigators*

Somewhat earlier I have indicated that a large proportion of work being done in the field of psychiatry is being undertaken by investigators in auxiliary fields. While I am not in favour of psychiatric research being taken over, there is a real need for greater respect and status being given these workers. Academic tenure should be granted the psychologists, for example, so that they can relate to and with psychiatrists who, on the whole, are less familiar with research techniques. Ours is a pretty exclusive union, but it behoves us to collaborate with our colleagues from ancillary disciplines to the utmost if progress is to be made. The value of psychology, which works in terms of quantitation and validation, has often superseded in esteem the role of judgmental capacities of the clinician. While the latter may be of equal or greater value, it presently needs validation in order to regain some of its lost status. On the other hand, as Hilgard[24] points out, psychologists must work closely with those experienced in depth therapy if they are to avoid pallid replicas of emotional events. They must deal, for instance, with emotional panic rather than the irritation of mild electric shocks. The above remarks need not be confined to psychologists by any means, and the participation of sociologists and anthropologists in collaboration with psychiatrists is already a heartening and healthy phenomenon.

The strategy of research with its current overemphasis on design has been criticized roundly by Hebb,[25] who points out that no research gets done by experiments which are beyond criticism. It might also be questioned whether we need a new type of M.D. in the psychiatric field. As already emphasized, the present training is so long that to expect a vigorous assumption of a research career at the end of it is rather much. Is there a place, say, for a psychiatrist-psychologist who has more training in the disciplines important to psychiatry and less in those that are not so pertinent? This type of suggestion has been proposed before and given rough treatment by the pundits, but there is no reason that it should now be considered a closed issue.

CONCLUDING COMMENTS

In closing, I would direct attention to one short article which is fraught with much judicial sense. This is Mirsky's presidential address to the American Psychosomatic Society in 1957.[26] In it he emphasizes that the tools of each discipline must be confined to the area in which they are germane. For example, he says: "The tools of biochemistry can yield no information about the rigidity of the superego." Secondly, he argues that the extension of the physiological concept of homeostasis to human behaviour and communication theory does not necessarily yield additional insights. The reader will find many other rewarding facets in this thoughtful paper.

In trying to view some of the difficulties in psychiatric research, I have in places tried to codify the uncodifiable. In this process the spontaneity which is so important a factor in research has been neglected. This is an essential part of the research process which is both invigorating and often intolerable to administrators, associated as it is with other traits which defy the restrictions of time and man-made rules. The individual still counts. This was emphasized by Dr. E. W. R. Steacie, president of the National Research Council of Canada, as reported by the press on December 6, 1958,[27] when he said that the problem of the future would be: "How do you keep your individual from being buried under so much red tape that his initiative is never visible to the outside world?"—and—"A team has never had an idea any more than a committee has had an idea"—and, finally: "The only reason our research has been successful is that attempts to organize it have failed."

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REVIEW ARTICLE

DYSPHAGIA AND ESOPHAGEAL DISEASE IN THE ADULT

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DIFFICULTY in swallowing (dysphagia) is often accepted with extraordinary complacency by both patients and doctors, probably because the condition is seldom painful and because the early clinical manifestations are often attributed to some other disturbance, e.g. cholecystitis or peptic ulcer. Furthermore, this outstanding symptom of esophageal dysfunction usually does not appear until late in the course of the underlying disease. Unfortunately, too, many doctors still feel that difficulty in swallowing is usually functional, or, if it is organic in origin, that nothing much can be done about it. Dysphagia, however, is rarely functional and it is equally rare that nothing can be done to relieve it. Recent advances in thoracic surgery have rendered most diseases of the esophagus amenable to alleviation, if not to cure.

ANATOMICAL CONSIDERATIONS

The esophagus in the adult is 25 to 30 cm. in length. It is a soft-walled, movable, muscular tube capable of considerable dilatation. As the esophagus passes through the chest it is intimately related to the trachea, aorta, heart and roots of the lung. It possesses several areas of narrowing: firstly, where it enters the thorax; secondly, at the level of the fourth thoracic vertebra (T4) where it is crossed by the arch of the aorta; thirdly, at the level of T5 where it is crossed by the left main stem bronchus, and finally at T10 which marks the diaphragmatic hiatus.

While the muscle layers are well developed, the strongest part of the esophagus is its mucous membrane. It is now well known that absence of a serous coat and a relatively weak muscular coat are not deterrents to healing, so long as the strength of this mucous layer is recognized during anastomosis.

The esophagus has an abundant lymphatic supply which drains into the paratracheal and inferior deep cervical nodes in its upper third; into the bronchial and mediastinal lymph nodes in its middle third and into the celiac and suprapancreatic nodes in its lower third. This exuberant lymphatic drainage explains why almost 50% of patients with cancer of the esophagus have metastases in the regional nodes at the time of operation.

The arterial blood supply comes from the inferior thyroid artery superiorly; from the bronchial arter-

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ies to its middle portion and from the inferior phrenic arteries and the esophageal branches of the left gastric artery to its lower third. The venous drainage is into the inferior thyroid vein and innominate vein superiorly; the azygos vein and superior vena cava from its middle portion and into the esophageal branches of the coronary vein of the stomach from its lower third. It is these latter channels which drain into the portal vein and, as collateral drainage, assume such importance as the site of varicosities and the source of bleeding in the presence of portal hypertension.

Swallowing is initiated centrally but depends upon intact glossopharyngeal nerves in its first stage so that interruption of these nerves, for example by poliomyelitis, results in inability to initiate the act of swallowing. The primary peristaltic wave is carried on by the motor action of the vagus nerves, while secondary waves are initiated by distension of the esophagus by the bolus of food. While the vagus is motor to the esophagus and inhibitory to the cardia, the role of the sympathetic nerves is not well understood but is probably of minor importance in esophageal function.

CLINICAL FEATURES OF ESOPHAGEAL DISEASE

A full and careful history must be patiently obtained, particularly to distinguish difficulties *in eating*, as may occur in local diseases of the mouth, tongue and pharynx, e.g. cancer of the tongue, bulbar palsy, etc., from true difficulty *in swallowing*. Unfortunately there are seldom any significant outward signs of difficulty in swallowing, whereas obstruction of the esophagus, regardless of the cause, is accompanied by broadly similar symptoms:

1. Excessive salivation is a common complaint of the patient with esophageal disease. The mechanism is difficult to explain, but it possibly results from a reflex stimulation of the salivary glands secondary to retained food in the esophagus, esophageal distension or irritation by reflux of gastric contents into the lower esophagus.

2. Intermittent retrosternal tightness is a frequent finding. It would be illuminating to know the number of middle-aged people being treated for myocardial ischemia whose electrocardiogram is normal but whose esophageal hiatus hernia remains unrecognized. This tightness follows distension of the stomach after eating, or is associated with migration of the stomach into the chest on exertion or straining; hence its confusion with angina pectoris.

3. Belching, epigastric discomfort after eating, and flatulence, often diagnosed as chronic cholecystitis, are features of the para-esophageal hiatus hernia in which the fundus of the distended stomach is trapped above the diaphragm. This type of hernia, as well as the sliding type, can best be recognized by careful radiographic examination with the patient in the head-down position.

4. "Heartburn" and "waterbrash" are the result of regurgitation of acid gastric contents into the lower esophagus when the patient stoops, strains or lies down. Such symptoms are almost pathognomonic of a sliding hiatus hernia with incompetence of the cardia of the stomach.

5. Pain on swallowing, although uncommon, may occur, but the site of the pain is seldom an accurate guide to the level of disease or to its nature.

6. Regurgitation of undigested food which is returned without nausea or effort must be carefully inquired into before accepting the patient's story of "vomiting". Such eructations are the result of overfilling of the dilated esophagus with consequent reverse peristalsis, or they may be due to a diverticulum. This symptom usually indicates important esophageal disease. It is frequently accompanied by foul breath, the embarrassment of which may bring the patient to the doctor.

7. Dysphagia or difficulty in swallowing is the most important symptom of esophageal disease. It may begin as a slight hesitancy in swallowing only, or as a feeling of food "sticking", but unless it is investigated at this stage it will progress through stages in which the patient is unable to swallow solids, then liquids and finally his own saliva.

COMPLICATIONS OF ESOPHAGEAL DISEASE

1. Weight loss is inevitable when dysphagia limits the food intake. It is not uncommon to see patients who have lost 30 to 50 lb. before they or their doctors become concerned, perhaps because present-day dietary faddism makes enforced food restriction more acceptable to the patient. Also, in the elderly, poor eating habits are not uncommon and will lead to weight loss early in the course of disease and so aid in early diagnosis.

2. Anemia may be the result of frank hematemesis but is usually a complication of chronic bleeding from an esophageal growth or ulceration due to reflux esophagitis. Occult blood in the stool will therefore be present in most of these patients.

3. Hematemesis is a rare complication of dysphagic esophageal disease in the absence of varices. More commonly the bleeding is slow and insidious and produces a secondary anemia.

4. Aspiration pneumonia, recurrent pneumonia and even lung abscess may be the reason that the patient seeks medical advice. Secondary infection of the bronchial tree due to aspiration of food particles from a distended esophagus, usually occurring when the patient lies down, is a frequent complication of esophageal obstruction. Cancer, achalasia and pharyngeal diverticulum are the most frequent causes of such obstruction.

5. Acute obstruction of the esophagus may be produced by the patient's partially obstructed gullet being completely blocked by a bread crust, unchewed piece of meat or fruit pith—usually that of an orange or grapefruit. This acute episode may

be the first inkling of serious esophageal disease noted by the patient.

6. Stricture of the esophagus is not an uncommon event in the healing stage of reflux esophagitis. The symptom of heartburn is gradually replaced by progressive dysphagia, and this complication ushers in a most vexing problem.

7. Hoarseness secondary to recurrent laryngeal nerve paralysis due to pressure from a pharyngeal diverticulum or to invasion by malignant growth may be the presenting complaint, as may malignant cervical node metastases, an enlarged liver and back pain due to extra-esophageal spread of a neoplasm.

DIAGNOSIS OF ESOPHAGEAL DISEASE

The above-mentioned symptoms are relatively common and not particularly specific, and therefore often ignored both by the patient and by his doctor. Unfortunately the patient is often treated with antacids, antispasmodics and diet under the misconception that the seat of this trouble is in the stomach, duodenum or gallbladder. It is only when dysphagia becomes prominent or when complications arise that an upper gastrointestinal series (barium meal) and esophagoscopy are ordered. These two methods of investigation are complementary, and it is rare that a definite diagnosis cannot be made by watching the progress of barium down the esophagus and then by directly inspecting its interior through an esophagoscope.

Esophagoscopy is indicated in every case of dysphagia even though the history and barium series may seem to have established the diagnosis beyond doubt. In this way a growth may be biopsied, its operability may be assessed and sometimes an unsuspected malignancy superimposed on a long-standing innocent lesion may be revealed. Bronchoscopy is always combined with esophagoscopy when cancer of the esophagus is present, to rule out invasion of the bronchial tree by the growth. The esophagoscope, however, is a dangerous instrument and should be used only by those aware of its risks and skilled in its use. Perforation of the esophagus as a result of rough or ill-advised endoscopy is highly lethal (Fig. 1) and demands the same emergency surgery as does perforation of a hollow viscus elsewhere in the body.

CAUSES OF DIFFICULTY IN SWALLOWING

A complete discussion of all the causes of dysphagia is beyond the scope of this paper, but a number of the less common causes of difficulty in swallowing should be mentioned.

1. Psychogenic disturbances are uncommon, but globus hystericus and the Plummer-Vinson syndrome have psychogenic components and merit exclusion.

2. Neuromuscular disorders such as bulbar palsy, bulbar poliomyelitis and myasthenia gravis should be kept in mind when difficulties in swallowing are present.

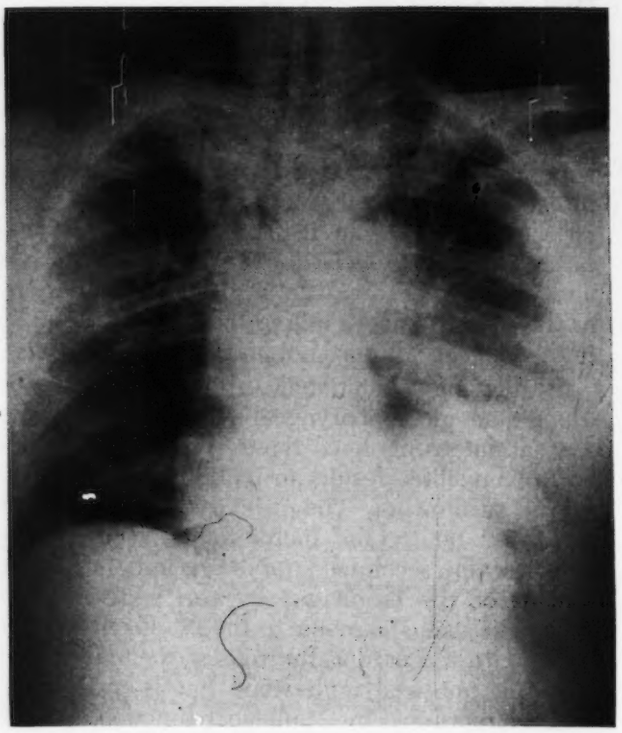

Fig. 1.—Gross subcutaneous and mediastinal emphysema with pulmonary infiltration and pleural effusion secondary to endoscopic perforation of the esophagus.

3. Oropharyngeal inflammation such as pharyngitis, tonsillitis and retropharyngeal abscess should rarely present a diagnostic problem.

4. Benign strictures secondary to swallowing corrosives or as a complication of scleroderma are rare. The commonest cause of simple stricture of the esophagus at any age is scarring and fibrosis which follows reflux esophagitis.

The commonest causes of difficulty in swallowing in clinical practice are esophageal diverticula, secondary compression of the esophagus, achalasia of the esophagus, carcinoma and sliding hiatus hernia.

Compression obstruction with or without displacement of the esophagus may result from enlargement of the thyroid gland, mediastinal tumours, aortic aneurysms and enlargement of the heart, particularly of the left auricle.

Dysphagia, regurgitation and chest pain are common presenting complaints, but these obstructive symptoms may be variable and are often masked by the features of the primary disease. Esophagoscopy and barium swallow will rule out intrinsic disease of the esophagus. The treatment, of course, is directed towards removal of the cause, whenever possible (Fig. 2).

Esophageal diverticula are sac-like protrusions which may include all layers of the esophageal wall (traction) or the mucous membrane only (pulsion).

Traction diverticula, although not uncommonly seen when a barium meal examination is being

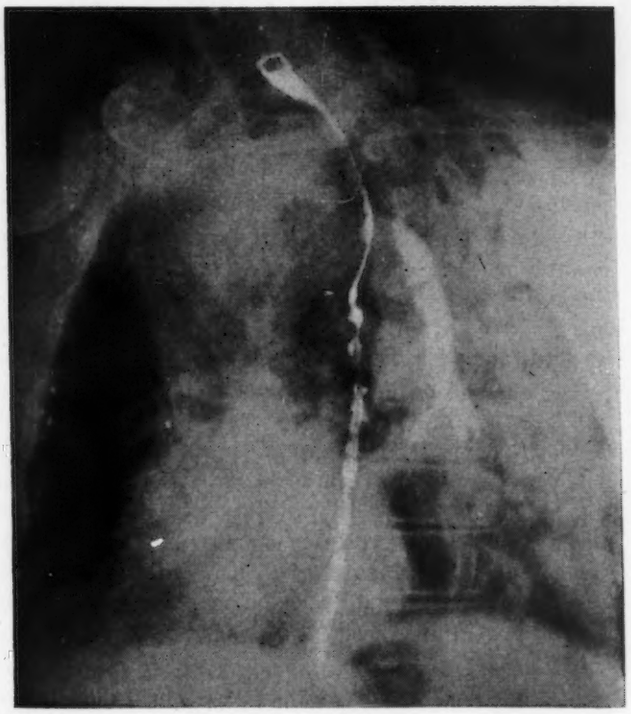

Fig. 2.—Compression of esophagus from malignant degeneration in an intrathoracic thyroid adenoma.

carried out for some other reason, seldom cause symptoms. Because they are almost always small and dependent, food is seldom caught in them and treatment is rarely necessary. They are usually secondary to scar contraction from tuberculous mediastinal lymph nodes and so are most common in the mid-esophagus.

Pulsion diverticula are much more frequently seen and result from a pouch of mucous membrane herniating between the anatomically weak triangular gap in the decussating fibres of the oblique and transverse (cricopharyngeus) parts of the inferior constrictor of the pharynx. Spasm of the cricopharyngeus muscle is said to be the predisposing cause. As the sac increases in size it loses its central position and descends into the superior mediastinum to the left of the spine (Fig. 3).

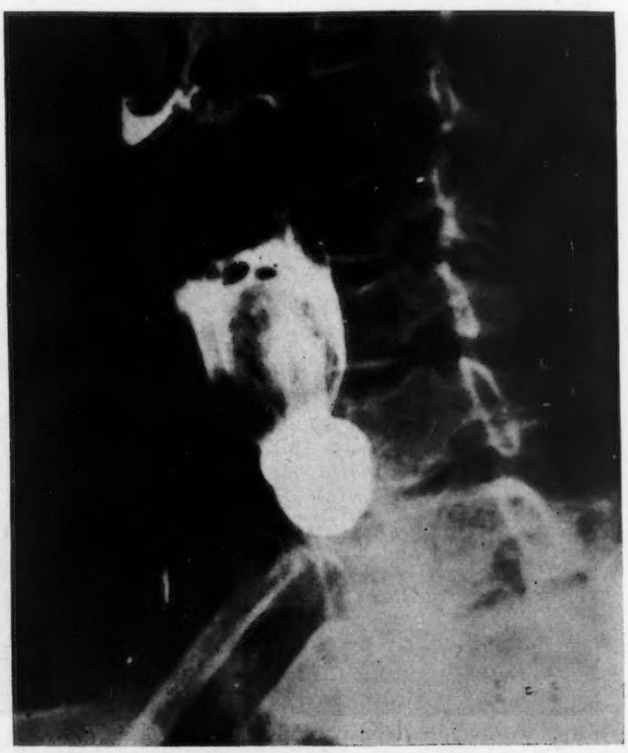

Fig. 3.—Classical pharyngeal pouch in a 68-year-old man.

The insidious onset of progressive dysphagia, regurgitation of undigested food, gurgling sounds in the neck, offensive breath, cough and often recurrent pneumonitis in an elderly male should make this diagnosis suspect. Confirmation is provided by barium meal examination and careful endoscopy, since the pouch may be entered in mistake for the esophageal lumen, and thus perforated.

In the early stages bouginage may be all that is necessary to overcome spasm, but once a sizable sac is present, one-stage resection of the pouch through the neck is necessary for cure.

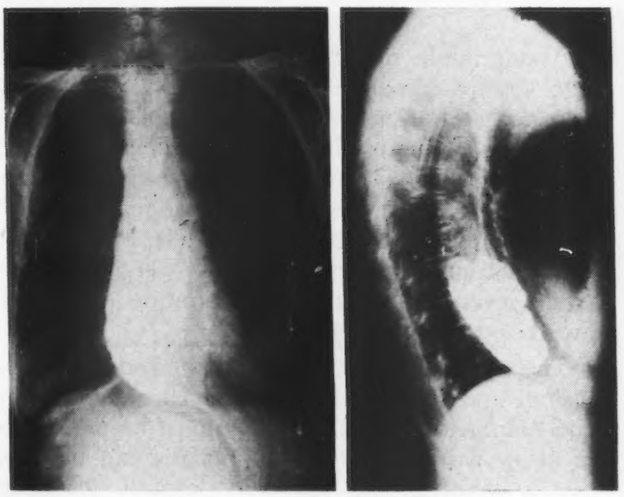

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Fig. 4a. and b.—Posteroanterior and lateral views of classical achalasia in a 73-year-old woman who presented with recurrent pneumonia.

Achalasia of the esophagus (or cardiospasm—a misnomer) is one of the most mysterious types of esophageal dysfunction. It appears to be a genuine disorder of function in that the motility pattern is grossly disturbed, which suggests that the derangement lies in the intrinsic neuromechanism of the organ itself. Atrophy of Auerbach's plexus has been described and the condition called megaesophagus which has been compared etiologically to megacolon. Others have suggested that the dilatation is secondary to spasm of the cardia, but the failure to demonstrate a cardiac sphincter makes the term "cardiospasm" a misnomer. Jackson long maintained that it was failure of the pinchcock mechanism of the diaphragm to open during the swallowing cycle which caused this lesion. In any case, eventually a tight constriction develops where the esophagus passes through the diaphragm at its point of entry into the stomach and enormous dilatation of the organ may result (Fig. 4).

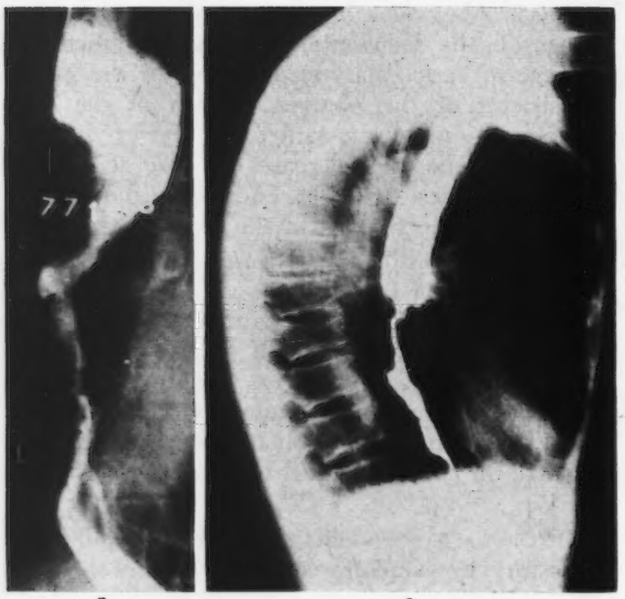

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Fig. 5.—Carcinoma of esophagus in an 83-year-old woman. Bronchoscopy revealed invasion of the trachea.

Fig. 6.—Carcinoma of the esophagus in a 66-year-old man.

Young adults may be affected although the older age groups predominate, probably because the lesion has run an intermittent course for years before becoming intolerable. Psychological conflicts at home or at work may be discovered by careful questioning, and episodes of discomfort are frequently initiated by emotional upsets. Fetid breath, regurgitation of undigested food, weight loss, anemia, severe dysphagia and aspiration pneumonia are the prominent features.

The diagnosis should be suspected from the history and may be confirmed by barium swallow and esophagoscopy. Endoscopy must be performed in every case so that the esophagus can be completely emptied and its wall carefully inspected for secondary malignant change, which is the commonest cause of death in this disease.

Although medical measures in the form of oral antispasmodics, psychotherapy and pneumatic or hydrostatic dilatation will result in an occasional cure, the only highly successful treatment is esophagogastric myotomy. This operation, which was devised by Heller, carries a 90% cure rate with a very small risk to the patient, even the frail patient, and is best performed through the chest.

Carcinoma of the esophagus remains a most serious disease for which no ideal treatment has yet been devised, mainly because the onset is so insidious. It is rare to see a patient who has not had symptoms of progressive dysphagia and weight loss dating back for as long as six months. Men are affected about ten times more often than women, predominantly in middle age. Squamous cell carcinoma is most frequently encountered and the lower esophagus is the commonest site.

Barium meal examination, esophagoscopy and bronchoscopy must all be done to confirm the diagnosis and to assess operability (Fig. 5). Unfortunately many patients are already incurable at the time they present, and this is borne out by the findings of local and regional spread of the growth in from 25 to 50% of patients at the time of exploration.

The aim of treatment is to restore the patient's ability to swallow, for the alternative is aphagia and starvation. Of the palliative procedures, gastrostomy has little if anything to recommend it but may be used as a complementary measure for the insertion of a Mousseau type of tube through the growth. Mackler and Souttar tubes may also be used and the latter can be inserted endoscopically but its metallic nature prevents the use of cobalt therapy while it is *in situ*. Generally speaking, all growths below the upper third of the esophagus can be resected or bypassed, while those in the upper third and hypopharynx are best treated by irradiation. By a combination of available methods cancer of the esophagus need no longer constitute a sentence of death from slow starvation (Fig. 6).

Hiatus hernia of the sliding type is one of the commonest causes of indigestion and dysphagia encountered in clinical practice today, yet 20 years ago this condition was virtually unrecognized. As a result of weakness of the diaphragm, and particularly the sling of the right crus as it encircles the esophagus, part of the stomach slides up into the chest cavity. Thus the sphincter mechanism which normally keeps the gastric content in the

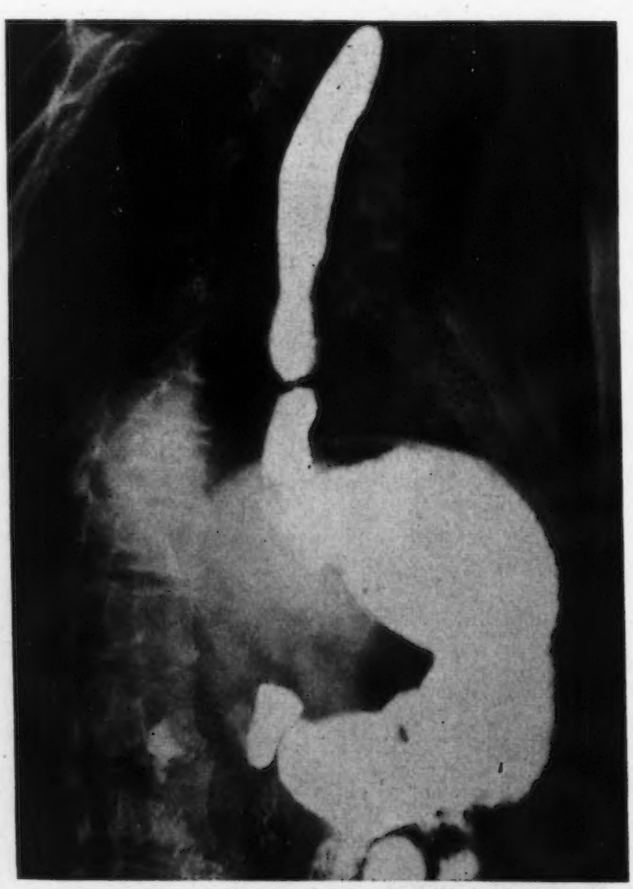

Fig. 7.—Localized stricture associated with hiatus hernia in a 61-year-old woman with a long history of indigestion and "heartburn".

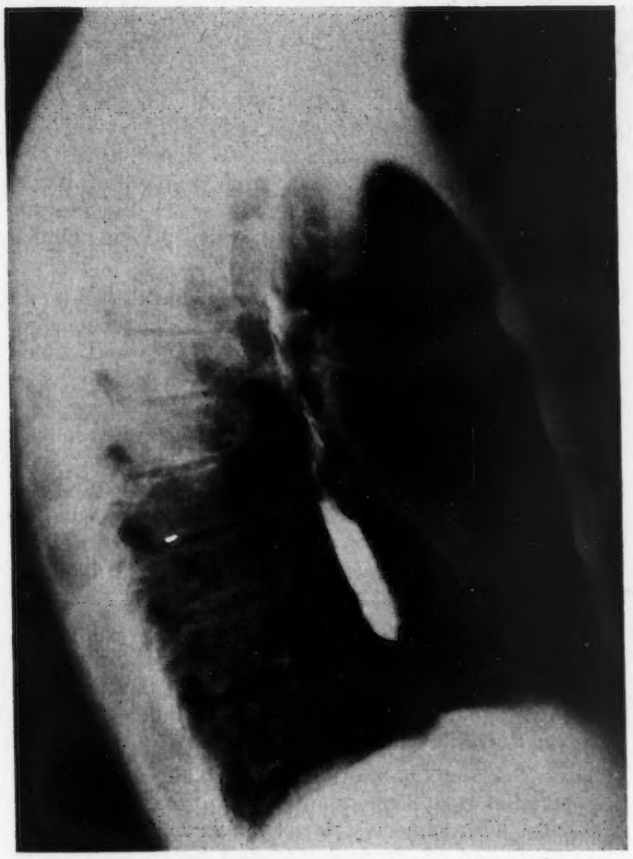

Fig. 8.—Complete esophageal stricture secondary to hiatus hernia. This required esophagogastrectomy to re-establish swallowing.

stomach becomes disorganized and "heartburn" and "waterbrash" develop when the patient stoops, strains or lies flat in bed at night. This reflux produces a chemical esophagitis which, if not corrected, may proceed through stages of ulceration, fibrous healing and finally stricture formation. When stricture develops, "heartburn" is relieved but is replaced by progressive dysphagia (Fig. 7). The common sufferer is a middle-aged, stout, flabby, "gallbladder type" woman who generally has had the latter organ removed without relief of her "indigestion".

In the less common type of para-esophageal hiatus hernia the cardia remains competent but the fundus of the stomach rolls up into the chest, and retrosternal fullness and discomfort, relieved by belching, are the features. Ulceration in and hemorrhage from this fundal pouch are not uncommon. This type of hernia may mimic angina pectoris, since the pain is often precipitated by exertion and eating.

The diagnosis depends upon a careful history and barium meal examination using the "head-down" position, repeating this procedure if necessary until the lesion is demonstrated. This may require three or four examinations in different positions when the clinical features suggest the diagnosis but radiographic proof is lacking. Esophagoscopy is usually confirmatory and may show ulceration or stricture or may reveal unsuspected malignancy.

Not all patients with reflux develop esophagitis and not all patients with hiatal hernias require operation. Medical measures, such as sleeping with the head of the bed elevated, weight reduction, bland diet and antacids, will control the symptoms in many patients and indeed may be all that is possible for the elderly. When symptoms are disabling or when complications are developing, or are established, operation is necessary. Two procedures are available; one is designed to prevent further reflux by mobilizing the lower esophagus, identifying the hernia and its sac, excising the latter and, after the stomach is restored to the abdominal cavity, reducing the size of the diaphragmatic hiatus. This is best performed through the chest. The second procedure is to restore the function of the esophagus when a fibrous stricture is established. Dilatation of the stricture alone is rarely successful unless the hernia is reduced as well. In many long-standing cases esophagogastrectomy is the only means of re-establishing the swallowing mechanism (Fig. 8).

CONCLUSIONS

Difficulty in swallowing is seldom functional but is usually the result of organic disease of the esophagus. Restoration of the ability to swallow can be obtained in most instances. The more prominent clinical features of esophageal disease have been emphasized and some of the commoner causes of dysphagia in the adult have been discussed.

PAGES OUT OF THE PAST: FROM THE JOURNAL OF FIFTY YEARS AGO

The Ottawa Medical Society held its regular monthly meeting February 10, in the Carnegie library. An interesting paper on "The Present Status of Conservative Gynæcology" was read by Dr. W. Travis Gibb. Dr. Gibb emphasized the reasonableness of the present tendency towards conservatism in the treatment of diseases of the internal genital organs of women, and was of opinion that when surgical intervention became necessary—it should be avoided whenever possible—the preservation of an organ or a portion of one which may be free from disease and able to functionate, and whose integrity is so important to the woman, should be looked upon as the height of gynæcological skill. The conclusions Dr. Gibb had reached in the treatment of gynæcological cases were: (1) to treat the case expectantly as long as there is the slightest chance of recovery without operation; (2) when operation is imperative, to save all the organs or parts of organs possible; (3) as a conservative operation is not necessarily an incomplete operation, to remove all organs or parts of organs that are so diseased that to save them would necessarily expose the patient to the dangers of a second operation; and (4) except in extreme cases or in those near or past the menopause, to save the patient her function of ovulation, or at least to leave her some part of ovarian tissue to avoid the psychical disturbance which follows the total oblation of these organs.—*Canadian Medical Association Journal*, 1: 289, April 1911.

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CASE REPORTS

EXSANGUINATING HEMORRHAGE FROM A SOLITARY POLYP OF THE COLON

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EXSANGUINATING hemorrhage from the large bowel is an uncommon occurrence that may present a difficult problem because its source is so frequently obscure, making the choice of the surgical procedure for its control most demanding of the surgeon called upon to treat this emergency. According to Peters,[1] the cause of massive bleeding per rectum remains obscure in from 27% to 40% of cases.

The feature of interest in the case to be reported is the observation that extensive hemorrhage may originate from a single small polyp. Although severe hemorrhage from both solitary and multiple polyps of the colon has been recognized,[2-4] no reference has been found in the literature to hemorrhage of such a degree as to justify the term "exsanguinating".

The problems of management of this type of hemorrhage, localization of the site of bleeding, and selection of the appropriate surgical procedure will be discussed briefly.

The patient, M.M., was a 37-year-old white woman, referred on March 1, 1959, for consultation regarding "heavy vaginal bleeding". The patient had experienced the onset of an expected normal menstrual period on February 25. The amount of bleeding was not unusual until March 1, the day of admission to hospital, when it became very heavy and was accompanied by the passage of large clots. This bleeding had been presumed to be vaginal.

The patient was not able to give any history, owing to her mental condition. However, she had been under constant care by the nursing staff of the hospital for several years, and there was no previous history of abnormal bleeding.

She was well developed, well nourished and of normal build. Her skin was very pale, and she was apathetic and listless. However, her skin was warm and dry, and there was no indication of shock. Temperature was 97.6° F., and pulse rate was 100 per minute, regular and of good volume; respiratory rate was 26/min. and the blood pressure was 96/60 mm. Hg.

The abdomen was soft and scaphoid in contour. There was no tenderness, guarding or rigidity. Rebound tenderness was not evident. No mass was palpable. The liver, spleen and kidneys were not enlarged. Bowel sounds were normal. On pelvic examination, visual and digital, it was noticed that no blood was issuing from the vagina, nor was there any sign of bleeding on vaginal examination, which was entirely negative. As a digital rectal examination was about to be performed, the patient passed a large amount of blood, consisting of numerous small clots, from the rectum. The amount was estimated at about 150 c.c. Digital rectal examination was normal.

It became obvious at this time from the patient's appearance that a large volume of blood had been lost. Immediate blood typing, cross-matching and blood counts were ordered. Without delay, a gentle, clear water enema was administered, and was returned very deeply blood-stained. Sigmoidoscopic examination was performed after the patient had been sedated with morphine, grain 1/6. The sigmoidoscope was passed to 25 cm. without difficulty and no abnormality was encountered except for fresh blood which appeared to be coming from a point proximal to the instrument.

The erythrocyte count was 3,510,000 per c.mm., hemoglobin value 41% and hematocrit 24%. The leukocyte count was 33,350 per c.mm., with a differential count of neutrophils 90%, staff cells 7%, lymphocytes 2%, and monocytes 1%; 2% of the total nucleated cells were nucleated erythrocytes.

After the sigmoidoscopy, the patient continued to pass blood clots in large quantities, approximately every half hour, with explosive bowel movements. Her blood pressure fell to 82/50 mm. Hg and her pulse rose to 140/min. A transfusion of 500 c.c. of whole blood was started. A Levin tube was passed and normal stomach contents were aspirated. Despite transfusion of a second pint of blood, the patient's condition continued to deteriorate as rectal blood loss persisted. She had an anoxic convulsion and manifested signs of cardiovascular collapse with no palpable arterial pulse or measurable blood pressure. A third pint of blood was administered by venous cut-down, being run simultaneously with the blood already being given. Despite a second venous cut-down and the simultaneous administration of two additional pints of blood by this route, the patient's condition remained critical. At times a thready pulse, too rapid to count, was palpable and a blood pressure reading of 50/0 could be obtained. Large amounts of blood were passed rectally at intervals.

By the next morning, after 10 pints of blood had been administered, no further blood was available, and levarterenol (Levophed) was given intravenously in doses of 4 c.c. added to 1000 c.c. of normal saline. Within the next hour her blood pressure began to rise, and no further bleeding was noted. Two hours later, the patient's pulse was stabilized at 120/min. and her blood pressure at 120/70 mm. Hg.

Immediate operation was elected in the form of exploratory laparotomy, since it was considered that a further episode of bleeding would be fatal were operation to be delayed.

Under general anesthesia (orotracheal with sodium thiopental (Pentothal), succinylcholine (Anectine), nitrous oxide and oxygen) a right paramedian incision was made with its midpoint at the level of the umbilicus. Upon entering the peritoneal cavity, the large bowel was seen to contain blood. The ileocecal valve was identified and the small bowel was traced to the ligament of Trietz. The small bowel, duodenum and

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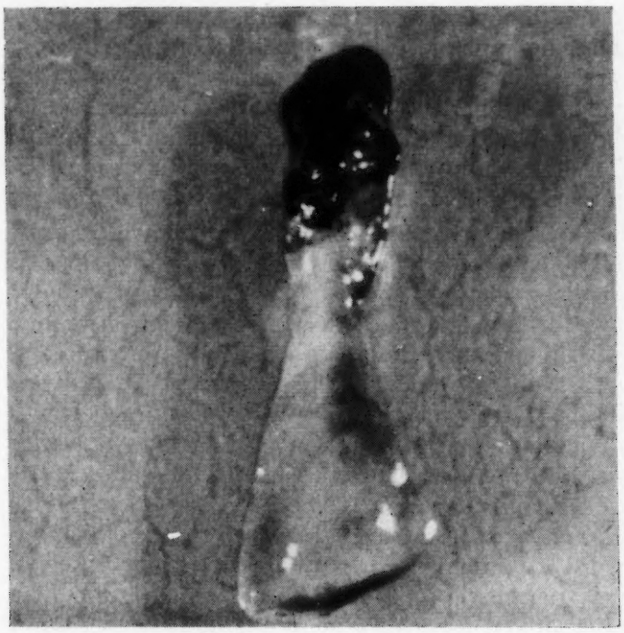

Fig. 1.—Polyp from sigmoid colon that was removed at laparotomy.

stomach were empty and normal in appearance. Liver and spleen were normal. The large bowel was distended with blood from the ileocecal valve to the rectum. No other visible abnormality was noted. On repeated, careful palpation, a small mass was felt in the sigmoid colon. The mass had the characteristics of a polyp, and a colotomy was performed at the level of attachment of the lesion. The polyp was doubly ligated at its base, flush with the wall of the colon, and excised. A small blood clot was present on the tip of the polyp. The colotomy wound was closed in two layers.

The postoperative course was uneventful. No further bleeding occurred. The blood count slowly returned to normal. One month later, the blood coagulation time was found to be 2½ minutes, the bleeding time 4 minutes, the platelet count 381,000/c.mm. and the prothrombin time 11 seconds (control 13.5 secs.), with a prothrombin activity of 63%.

The pathological report described the specimen as a polypoid lesion on a long slender stalk. It measured 3 cm. in length and had an average diameter at the tip of 7 mm. Its narrowest diameter was 3 mm. and its base measured 1 cm. The apex was reddish brown and granular, but otherwise unaltered (Fig. 1).

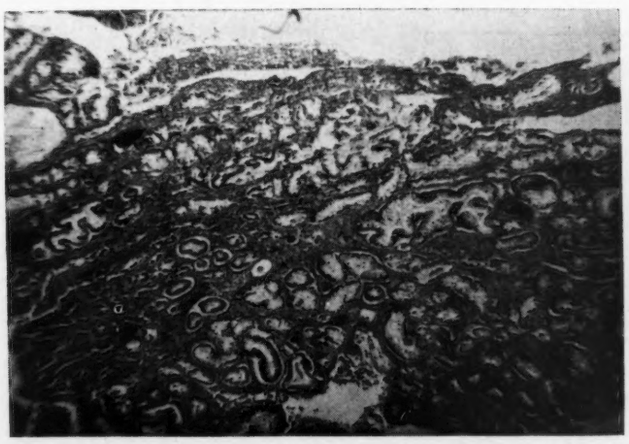

Fig. 2.—Photomicrograph of a section of the polyp.

In microscopic sections, the long narrow stalk was covered by essentially normal colonic mucosa, actively secreting mucus. The supporting stroma contained focal collections of mononuclear cells (Fig. 2). In the apex of the polypoid lesion the mucosa assumed a more atypical pattern. The glands varied somewhat in size and the epithelial cells appeared less active in their mucus-secreting activity in some areas. Along one margin of the apex there was a large venous channel containing blood (Fig. 3). In the adjacent area there was a well-formed thrombus. The perivascular connective tissue about this vessel was infiltrated with various mononuclear cells and some polymorphonuclear leukocytes, and at one point there appeared to be a communication between the thrombus and the lumen of the vessel.

Fig. 3.—Photomicrograph showing a large venous channel communicating with the thrombus.

The pathological diagnosis was "Benign adenomatous polyp of the sigmoid colon."

The pathologist observed that the rather large venous channel in the apex of this adenomatous polyp was rather unusual and probably accounted for the severe bleeding noted clinically.

In the ensuing months, barium enemas with air contrast (Figs. 4 and 5) were performed on three occasions with the object of demonstrating or excluding the presence of additional polyps in the large bowel. None were found. To the date of this report the patient had remained well, and had had no further bleeding.

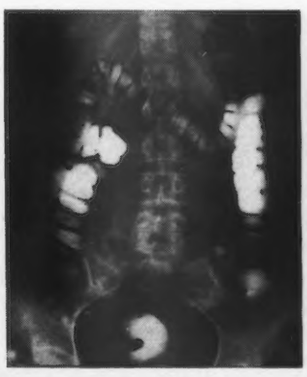

Fig. 4

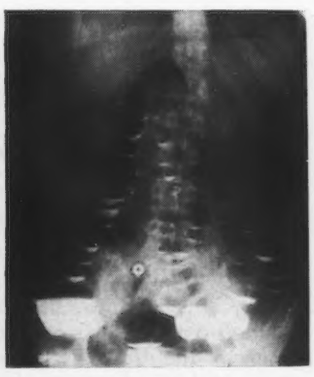

Fig. 5

Figs. 4 and 5.—Radiographs from barium enema series (air contrast) taken postoperatively.

DISCUSSION

The major difficulty in this case was the problem of management of the bleeding and the selection of the appropriate time for operation. The rate of blood loss was so great that blood replacement, even by two cut-downs running at the same time, was insufficient to improve the patient's condition. In the face of such a massive hemorrhage, and with no reason to expect that it would stop or lessen, the temptation to operate, despite the patient's poor condition, was great. In this particular case, because of the fortuitous abatement of bleeding, it was possible to operate when the patient's condition had greatly improved, whereas earlier operation might have been fatal. In spite of the successful outcome in this case, it is felt that delay in operation is unwarranted, because there is no way of predicting how long bleeding will continue, and if no definitive measures are undertaken the patient may die of blood loss. It is felt that in the future the same criteria should be adopted as those indicated for the management of upper gastrointestinal bleeding, i.e. emergency operation if the patient fails to improve after the administration of four pints of blood in 24 hours or if deterioration continues over a period of four hours despite energetic blood replacement.

Preoperative diagnosis of the underlying lesion may be impossible because the seriousness of the situation and the patient's condition may preclude any investigation beyond the most simple procedures. However, it may be possible to narrow the field of diagnostic possibilities to some extent. Thus the absence of blood in the stomach upon gastric intubation would rule against the probability of gastric or esophageal lesions. In regional enteritis, tumours of the small bowel, diverticulitis and ulcerative colitis, all of which are possible but infrequent causes of massive bleeding, the bleeding does not occur until late in the disease and in such cases the past history may be of help. Papillary tumours in the rectum and hemorrhoids can be detected on physical examination. The extreme rarity of endometriosis as a cause of rectal bleeding weighs against the probability of this lesion as a cause of massive rectal bleeding. Among the remaining possible causes which include lipomatosis of the ileocecal valve, carcinoma or polyposis of the colon, and perhaps, duodenal ulcers, there seems to be no way of differentiating with any certainty. The technique of exploratory laparotomy must be modified by the features of the individual case.

The operative finding of a large bowel entirely filled with blood is unusual. Usually the blood is confined to the colon for a limited distance above the bleeding point. When the colon is distended with blood, palpation of a small polyp is not easy, and the lesion may readily be missed. Should this happen, the choice of surgical procedure becomes difficult. A partial resection is indicated, but with the entire colon filled with blood, the surgeon has difficulty in deciding which area to resect. In this circumstance the use of three or more colotomies, with or without the use of a sterile sigmoidoscope, may permit recognition of the bleeding lesion. The alternative, especially in a patient who cannot withstand a prolonged procedure, is blind resection of the left or right colon, in the hope that the bleeding point will be included in the resected segment. In this situation the surgeon's choice is admittedly governed largely by chance.

SUMMARY

A case of exsanguinating hemorrhage from a small solitary polyp of the sigmoid colon is presented. The clinical picture and operative and pathological findings are described. Problems of diagnosis and management of this emergency are briefly discussed.

The author is indebted to Robert F. Wulf, M.D., F.A.C.S., for permission to publish this case, and for his advice and guidance in the patient's management. James B. Haworth, M.D., performed radiological procedures and Lyle W. Lidbeck, M.D., the pathological studies and photographs.

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PAGES OUT OF THE PAST: FROM THE JOURNAL OF FIFTY YEARS AGO

COCAINE IN QUEBEC

New evils require new remedies, and the legislature of Quebec has applied a drastic one to the abuse of cocaine. This drug is extremely cheap. It is quoted at a little over two cents a grain in tablet form, and in bulk it could doubtless be procured at a much lower rate. It is so much cheaper and more readily portable than alcohol, that it should be subject to some supervision at least. Probably the use of the drug as a means of intoxication is not widespread, and the discovery that a few degenerate creatures in the lower levels of city life employ it to alleviate their sense of misery, has given to it a fictitious importance.

The new regulation provides that the drug cannot be sold in any form without a physician's prescription. The dealers are in entire agreement that this is a wise measure, although one member of a deputation of wholesale druggists went so far as to suggest that the importation, sale, and use should be entirely prohibited. Under a strict interpretation of the rule the sale of nostrums containing cocaine would have been prohibited, which in itself would not be a grievous calamity. The manufacturers offered an amendment which would permit of the sale of preparations which contain a minimum of any given drug. In the case of morphine it was placed at one-third of a grain to the ounce.—Excerpt from editorial, *Canadian Medical Association Journal*, 1: 359, April 1911.

HERNIATION THROUGH THE COUNTERINCISION OF A DIAPHRAGMATIC HERNIA REPAIR

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WITH THE recent increase in operations for correction of diaphragmatic hernia, the postoperative complication of rupture of the diaphragm is likely to be encountered more frequently. This report will describe one such case observed by the authors, in which the correct anatomical diagnosis was made before surgical intervention.

In 1957, Loitman *et al.*[1] reviewed the radiological and surgical literature and found that there were very few cases of this condition reported at that time. Sweet[2] previously reported one recurrence of hiatus hernia through the diaphragm medial to the esophageal hiatus, in a series of 111 cases. In Harrington's[3] review of 430 cases, recurrence was reported in 10 cases, including one of congenital hernia of the diaphragm. No evidence of dehiscence of the counterincision was described in this report. In a recent report by Boyd[5] the hazard of making a counterincision in the diaphragm was emphasized and a case was reported in which dehiscence of the counterincision occurred on two occasions. Two cases of postoperative diaphragmatic hernia following surgical division of the diaphragm for esophageal tumour and for benign esophageal stricture were reported by Carter, Giuseffi and Fellson.[6] These authors also warned that with increasing use of the transdiaphragmatic approach for many esophageal lesions, an increase in the incidence of postoperative diaphragmatic hernia may result. Commonly, this counterincision is used for hiatus hernioplasty and esophagectomy when these procedures are carried out through the thorax.

Diaphragmatic hernias are usually classified as traumatic or non-traumatic. Non-traumatic types include congenital and acquired hernias occurring at various points of embryological weakness. Traumatic hernias include those due to direct injury, indirect injury and rupture following inflammatory necrosis. It is considered by Carter that this group should be extended to include those arising postoperatively from an incision in the diaphragm.

Mrs. E.P., a 48-year-old white woman, was admitted to the New Mount Sinai Hospital, Toronto, February 16, 1957, with a typical history and findings of a sliding type of esophageal hiatus hernia. The following is a report of the operative repair of this lesion which was performed by another surgeon at that time.

"Under general endotracheal anesthesia an incision into the thoracic cavity on the left side was made through the 7th interspace. The region of the lower esophagus was exposed. Following mobilization of the esophagus the phrenic nerve was crushed, paralyzing the left diaphragm. The diaphragm was incised anterolaterally in order to reduce the hernia and to repair it adequately. The counterincision was sewn with interrupted 00 silk sutures. The diaphragm was closed, a drain was left in the chest, leading to an underwater seal, and the chest was closed in layers. The patient was returned from the operating room in good condition."

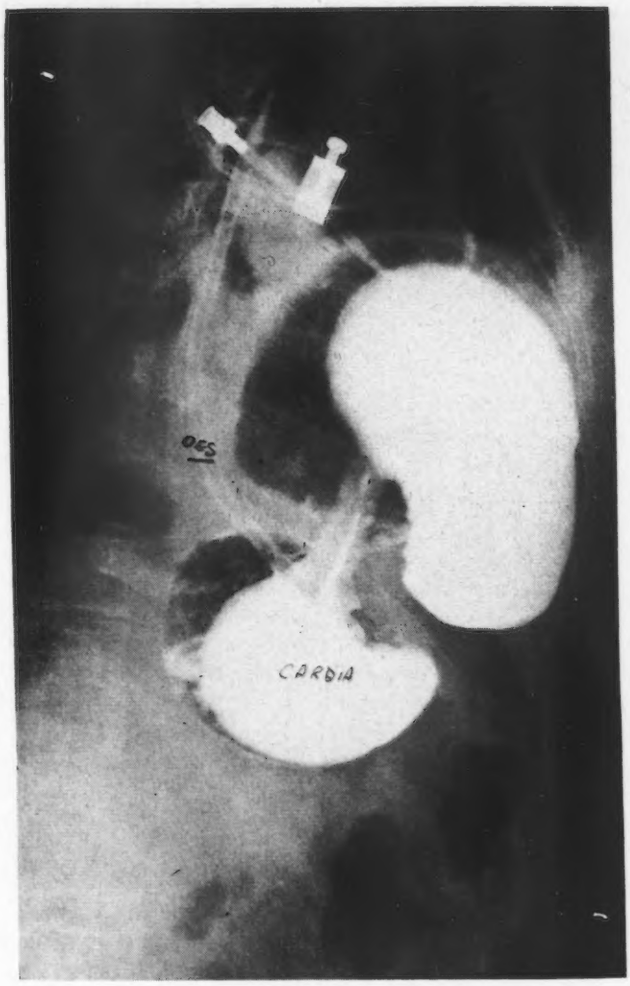

Fig. 1.—Note Levin tube in esophagus, with cardia below diaphragm and body of stomach within thorax.

On the fourth postoperative day the drain from the left chest was removed. The patient developed a pneumonic infiltration at the right base on the fifth postoperative day. With antibiotics this cleared rapidly and the patient made an uneventful recovery and returned to her home.

Eight months later, the patient suddenly experienced the onset of epigastric pain. Associated with this she began to vomit continuously and was unable to retain any food or fluid.

When seen several hours after the onset of these symptoms, the physical examination was normal except for the chest, which was dull to percussion over the lower left half. Breath sounds were distant in the upper portion of the left chest and could not be heard throughout the entire lower left chest. The abdomen was slightly distended. There were no masses palpable and on the next morning roentgenographic examination was carried out.

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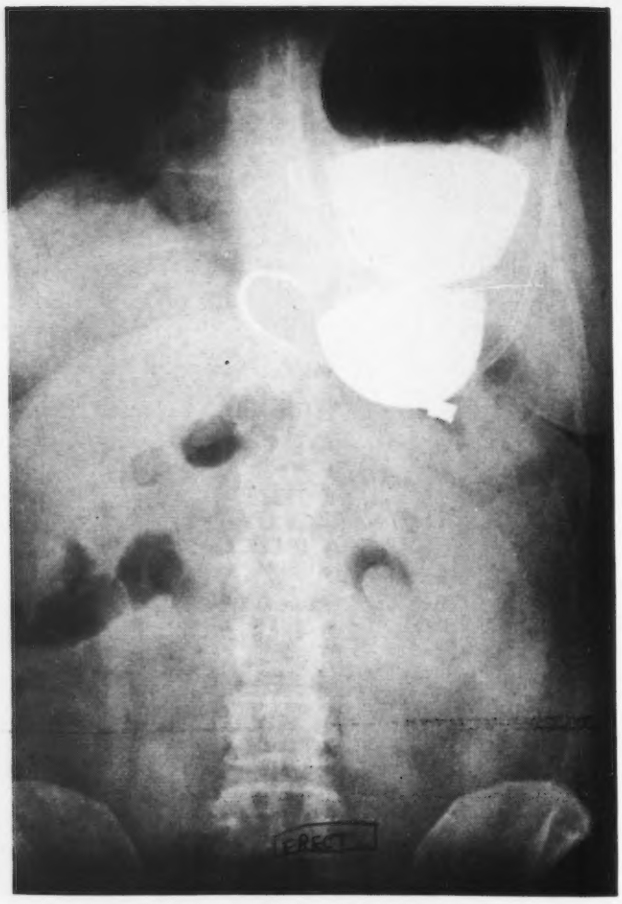

Fig. 2.—Note large gas bubble within thorax.

Radiographs of the chest revealed that there was a tremendous gas bubble present within the left hemithorax. This gas bubble had a large fluid-air level and there was a shift of the mediastinal contents away from the left chest towards the right. During fluoroscopy, sharp inspiration revealed paradoxical movement of the fluid level in the left chest. (It should be noted that the patient had undergone a phrenic crush procedure during the repair of the previous hiatus hernia.) The exact position of the left leaf of the diaphragm could not be outlined adequately on the plain films. The patient was then given a barium meal which showed the esophagus to be in fairly normal position (Figs. 1 and 2). The cardia filled well with barium and lay in a normal position for this portion of the stomach. It was apparently infradiaphragmatic in position at this time. No abnormality in the esophageal hiatus was evident. Following this a narrow track of barium was noted, leading upwards into the left hemithorax, and the remainder of the barium could be pushed up into this large loculus of the stomach, which was in the thoracic cavity. This narrow constriction remained constant and did not change during the various phases of respiration. The barium filled this upper loculus of the stomach in the thorax and after approximately four hours some of it trickled downwards through the same narrow hiatus into the abdomen through what appeared to be an attenuated pyloric canal. In view of the recent history of repair of a diaphragmatic hernia through the thorax, and from the position of the herniated portion of stomach, it was considered likely that this was a herniation of the stomach through the counterincision in the left diaphragm. At the time of the radiological examination the cardia was well below the diaphragm and there was obviously some volvulus of the stomach as it passed through the dehiscence of the diaphragmatic incision.

Findings and Procedure at Operation

Five hours later, the patient was taken to the operating room. On exploration of the abdomen, only the duodenum and the pylorus could be identified within the abdomen. The remainder of the stomach was above the diaphragm. With the finger, the presence of a hiatus approximately the size of a silver dollar could be felt in the mid portion of the diaphragm, through which the whole of the stomach had herniated. This hole was separate and distinct from the esophageal hiatus. Apparently since the roentgen examination the remainder of the stomach had worked its way into the left chest through this aperture. With application of gentle traction, the entire stomach was slowly delivered back into the abdomen. The large defect in the diaphragm, which was obviously a dehiscence of the counterincision and which was about one inch from the esophageal hiatus, was then closed by interrupted heavy silk sutures. Before inserting the final suture the lung was reinflated and all of the fluid from the chest cavity was expressed into the abdomen. The abdominal wound was then closed in the usual manner.

DISCUSSION

Such postoperative dehiscence of the diaphragm and herniation of the stomach is unusual but is likely to increase in frequency as more approaches are made transthoracically with counterincisions in the diaphragm. Surgical repair of esophageal hiatus hernia has been carried out more frequently in recent years, no doubt owing to the fact that the dangers of reflux esophagitis are now better understood and because Allison has elucidated the anatomy of a satisfactory repair. Though there is no question that the exposure through the thorax is an excellent one, a counterincision becomes a necessary part of the operation especially if one performs a vagectomy which must be followed by some additional procedure such as pyloroplasty or gastroenterostomy. It is also true that a counterincision is not necessary with the abdominal approach to the repair of such hernias. Recent reappraisal by the authors of this approach through the abdomen has been gratifying and has obviated the necessity and danger of the counterincision.

This condition when recognized demands immediate diagnosis and prompt surgical correction of the abnormality. Loitman reported one death in the two cases that he documented. Carter *et al.* have also reported a death after herniation of the stomach through the diaphragm. When it is considered necessary to make a counterincision in the diaphragm, it is suggested that great care be used to ensure permanent closure of such an incision.

SUMMARY

A case of dehiscence of the diaphragmatic counterincision of a hiatus hernia repair is reported. The recent

literature pertaining to this condition has been reviewed. The urgency of accurate and early diagnosis has been stressed. The frequent need of the counter-incision in the transthoracic repair of esophageal hiatus hernia lends more weight to a recently expressed preference for repair by an abdominal approach.

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SHORT COMMUNICATIONS

STUDIES ON HURLER'S SYNDROME*

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IN THE course of our studies of the mucopolysaccharides of connective tissues, we became interested in Hurler's syndrome, or gargoylism, an inherited disease involving the skeleton, blood vessels, liver, spleen, brain and other tissues. Brante in 1952 first demonstrated the accumulation of sulfated polysaccharides in the organs of patients with Hurler's syndrome. In 1956, Stacey and Barker in Birmingham, England, and Brown in St. Louis reported the isolation in large quantities of a heparin-like substance from liver of some cases. Brown called attention to the similarity of this substance with a fraction we had isolated from the liver of secondary amyloidosis and later from normal aortas of bovine and human origin and named by us heparitin sulfate. In 1957, Dorfman, and in 1958 our group reported that patients with gargoylism excrete in their urine two mucopolysaccharides in large quantities, chondroitin sulfate B (ChS-B) and heparitin sulfate (Hep S). In 1959 we reported the unequal accumulation of these two polysaccharides in various organs in patients with gargoylism.

Chemically the two mucopolysaccharides involved in this disease are unrelated. ChS-B is an unbranched polysaccharide, composed mainly of units of L-iduronyl-3-α-N-acetylgalactosamine-4-sulfate linked by β-linkages to the 4-position of the iduronyl groups. The structure of Hep S is still unknown. It is composed of disaccharide units containing D-glucosamine and a hexuronic acid, presumably glucuronic acid. In the main fraction of Hep S about one-half of the amino group is N-sulfated, the other half N-acetylated. From recent studies in our laboratory it was concluded that Hep S is a highly branched polymer with N-acetylated and sulfate-free disaccharide units located mainly in the outer branches and N-sulfated together with O-sulfated disaccharide units located in the inner core.

Among some 20 cases of gargoylism studied, two excreted in their urine only Hep S and probably had a disease distinct from Hurler's syndrome, the rest excreted a mixture of ChS-B and Hep S. In the majority of cases, ChS-B accounted for 60% to 90% of the mucopolysaccharides and Hep S between 40% and 10%. In our experience neither of the two polysaccharides has been demonstrated in urine of normal individuals or patients with connective tissue diseases.

We have obtained organs from a total of seven necropsies of patients with gargoylism. In the livers of five out of six cases, 70% to 90% of the total mucopolysaccharide fraction was Hep S, the rest mainly ChS-B. In one case the liver yielded approximately equal quantities of the two polysaccharides. The polysaccharides of the spleen in these cases were mostly ChS-B, with a minor component of Hep S. In brain, kidney and other organs the distribution of the mucopolysaccharides varied, but as a rule ChS-B predominated.

Of special interest were two recent cases which had been studied in Babies Hospital by Dr. Melvin M. Grumbach and from which organs were obtained at autopsy by Dr. Dorothy Anderson.* Chemical, clinical and histological data were very similar in these two cases, a girl of 5½ and a boy of 9 years. Both had all the classical symptoms of Hurler's disease and had died suddenly at home. The urine of the girl had contained 78 mg. per litre of mixed polysaccharide, of which 90% was ChS-B, the rest mainly Hep S. The urine of the boy had yielded 145 mg. per litre of mixed polysaccharide, of which 80% was ChS-B, the rest mainly Hep S. The polysaccharides of the liver in both cases were mainly Hep S, those of the spleen

*From the Department of Medicine, Columbia University College of Physicians and Surgeons, Presbyterian Hospital, New York, N.Y. This article is a condensed version of the communication presented by the author at the University of Toronto, November 1960, in connection with the ceremonies associated with the Gairdner Awards for 1959.
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*We are greatly indebted to Drs. Grumbach and Anderson for making the material available to us.

mainly ChS-B. In both cases ChS-B was isolated from hyaline cartilage and bone, in the latter in yields of 11% and 12%, respectively, while no definite fraction of Hep S could be detected in these tissues. The major polysaccharides in cartilage and bone, however, were a mixture of ChS-A and -C and kerato sulfate, i.e., the polysaccharides found normally in these tissues, while the finding of ChS-B is abnormal for the skeletal tissues.

The most outstanding histological findings were bands of abnormal collagen in the skeleton and severe thickening of the intima, especially of the medium-size arteries, including the coronary arteries, the lumina of which were narrow slits. These arterial changes were similar to arteriosclerotic changes of older individuals. Similar findings have been reported in Hurler's syndrome by other authors, and they explain the frequency of death by coronary occlusion or heart failure at young age in this disease.

The nature of the primary defect in Hurler's syndrome is still unknown. Some, if not all, of the symptoms are probably explained by the abnormal production and storage of the wrong polysaccharides in the tissues which either should not contain them at all or should contain other types instead. The unequal distribution of the two polysaccharides in liver versus spleen might be due to the production of ChS-B by fibroblasts present in all organs, while Hep S may be mainly derived from mast cells, with the liver parenchyma cells storing intracellularly Hep S produced in the tissues of the alimentary canal.

The normal occurrence of ChS-B and Hep S in the aorta and apparently in all arterial tissue may be of considerable significance. The severe arterial disease in these children calls attention to the increase of both ChS-B and especially Hep S in human aortas with increasing age and arteriosclerosis, as reported recently by Kaplan and Meyer. We suspect that Hep S is a causative agent in the proliferation of connective tissue elements. In any case, it is our belief that the further study of this rare disease may give us valuable information about the normal function of the mucopolysaccharides and the mechanism of arterial disease.

"FRINGE BENEFITS" OF GYNECOLOGICAL CYTOLOGY*

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EXFOLIATIVE CYTOLOGY is acknowledged as a sensitive and accurate cancer detection test. The method has been utilized most extensively in gynecology for the detection of carcinoma *in situ* of the cervix. Experienced cytologists report an accuracy of over 90% in detection of this lesion. Exfoliative cytology may be applied in the detection of diseases other than cancer. Frequently a cytological report negative for tumour cells is valuable in diagnosing other conditions or diseases. It is fortunate that this application of cytology is most fruitful in gynecology, thereby reinforcing the reasons why women should have a yearly vaginal Papanicolaou smear taken.

LEUKORRHEA

A variable proportion (5-15%) of the work load of hospital departments of bacteriology is the smearing and culturing of vaginal swabs and the examination of hanging drop preparations of vaginal secretions. It is an axiom in gynecology that no bacteriological culture is justified until Trichomonas and Monilia infections are ruled out. Examination of the vaginal Papanicolaou smear is an easy and effective means of excluding or confirming that the leukorrhea is due to these particular etiological agents.[1] Leukorrhea may be caused by viral infections of the cervix. Bacteriological cultures in such cases will be negative for pathogenic bacteria. Viral inclusion bodies may be found in a Papanicolaou smear and the correct diagnosis suggested.[2] Numerous multinucleated giant histiocytes in the Papanicolaou smear may indicate that the cause of the leukorrhea is a foreign body or tuberculosis. The routine Papanicolaou smear is of no value in detecting specific bacterial causal agents of leukorrhea.

AMENORRHEA, MENORRHAGIA AND METRORRHAGIA

The vaginal smear is a crude indirect measurement of the cyclic variation of estrogen and progesterone as manifested by the maturation of the vaginal mucosa.[3] Estrogen primarily causes complete squamous maturation, whereas progesterone impedes complete maturation. If disturbances in menstruation are due to hormonal imbalance, the smear will show a shift in the number and type of cells present. This may suggest functioning follicular or luteum cysts or a hormone-secreting ovarian tumour as the cause of the altered menstrual cycle. The finding of non-degenerated endometrial cells in a vaginal smear obtained beyond the tenth day of the menstrual cycle may suggest hyperplasia of the endometrium, an endometrial polyp or irregu-

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lar menstrual shedding as the cause of the symptoms.

PREGNANCY

The profound alteration in hormonal secretions induced by pregnancy is reflected in the types of cells found in the vaginal smear. The alterations in the hormonal smear patterns occur slowly over a period of weeks, and the Papanicolaou smear usually serves only as confirmatory evidence. During the first trimester the smear may reveal a pattern suggestive of or diagnostic of pregnancy.[4] This facet of cytology may assist in the diagnosis of ectopic pregnancy beyond six weeks' gestation.[5] Threatened abortion and fetal death *in utero* may be suggested by examination of the Papanicolaou smear, as the smear pattern of pregnancy will alter or revert with the fluctuation in the levels of circulating hormones.[6]

It is not fully appreciated that cervical carcinoma occurs in pregnant women with the same incidence as in non-pregnant women.[7] Leukorrhea, which is a common complaint of pregnancy, may also be due to a cervical carcinoma which can be diagnosed by a cervical smear. In theory, Sheehan's syndrome could be provisionally diagnosed by examination of a vaginal smear obtained three to six months post partum.

STERILITY

In the investigation of sterility, the vaginal smear may be of assistance. The hormonal smear pattern obtained by a study of weekly Papanicolaou smears during a cycle may suggest estrogenic deficiency or anovulatory cycles as the cause of the sterility. In addition, the vaginal smear containing numerous well-preserved cells offers excellent visualization of the nuclear chromatin sex mass, thereby confirming the fact that the patient is truly a genetic as well as a somatic female. Rarely, because the condition is rare, the Papanicolaou smear will reveal that the patient has Turner's syndrome.

MENOPAUSE

The menopausal syndrome is usually easily diagnosed clinically. However, in some instances the clinician does not know whether the symptoms are due to the menopause or to other conditions. Although the hormonal pattern in vaginal smears is not diagnostic of the menopause, the smear may reveal a pattern consistent with the menopause, namely that of decreased estrogenic effect.[8] Conversely the postmenopausal woman may reveal sustained estrogenic effect, which is reflected in the vaginal smear pattern. This method of evaluating persisting estrogenic effect is utilized in deciding which patients with carcinoma of the breast may benefit from oophorectomy.

SUMMARY

In addition to being an accurate and the easiest and safest method of detecting cervical carcinoma, the routine vaginal Papanicolaou smear has numerous "fringe benefits". These include the diagnosis of certain causes of leukorrhea and disturbances of menstruation, as well as the diagnosis of pregnancy, threatened abortion and some causes of sterility. This information is obtained without special study or stains, during the routine screening of vaginal Papanicolaou smears, and requires only an accompanying accurate menstrual history. It must be re-emphasized that every woman over 25 years of age, including pregnant women, should have a yearly vaginal Papanicolaou smear examination.

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PAGES OUT OF THE PAST: FROM THE JOURNAL OF FIFTY YEARS AGO

ROYAL COMMISSION ON TUBERCULOSIS

The Royal Commission, which has been enquiring into the prevalence of tuberculosis in Quebec, has presented its report to the government. The Commission calls attention to the fact that while other countries, by active measures, have reduced the mortality from this disease by forty to fifty per cent., in Quebec the death rate remains stationary. A vigorous campaign is therefore urged. The following measures against the disease are outlined: educational campaign, obligatory declaration of tuberculosis, obligatory disinfection, rules against spitting in public, anti-tuberculosis dispensaries, isolation of sufferers. Under the heading of preventive measures are the following: medical inspection of schools and industrial establishments; condemnation of unsanitary dwellings; the prevention of alcoholism; the establishment of "preventoriums"; schools in the open air; vacation colonies.

The Commission recommends that the following measures be put into execution immediately: more rigorous application of laws contained in the statutes regarding tuberculosis; elementary instruction on hygiene in the primary schools, normal schools, and other houses of education; popular instruction under the direction of the board of health; medical inspection of schools and shops and factories; the establishment and maintenance of anti-tuberculosis dispensaries in the principal centres of the province; isolation of advanced cases among the poor; establishment of open air schools for weak children who are prone to tuberculosis; treatment of curable cases by the "class" method, as it has been demonstrated that this is a method of treatment almost equal in results to sanitariums and much more economical, giving to the patients besides the opportunity of living with their family; legislation to prohibit the employment of young children; investigation and legislation regarding the hours of labour of adults in factories; legislation against alcoholism; meat inspection and the control of the sale of milk.—Excerpt from editorial, *Canadian Medical Asssociation Journal*, 1: 356, April 1911.

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PSYCHIATRY IN A CHILDREN'S HOSPITAL

WHILE individuals have shown a *special* interest in the behavioural disorders of childhood for many years, it is only within the last 30 to 40 years that this interest has developed into a recognized specialty or subspecialty of psychiatry.

Originally the physician counselled the parents himself and carried out therapy with the child. Then came the child guidance clinic with its clinical team, the psychiatrist, the social worker and the psychologist. Such child guidance clinics tended to be community-oriented, relating more closely to the social agencies than to medicine. The development of psychiatric facilities in children's hospitals, while present in a few hospitals for many years, has been in general a recent development. At the present time such services are present in almost all the major pediatric hospitals in Canada, and almost every Canadian medical school has a child psychiatrist attached to its department of pediatrics.

The psychiatric services in a children's hospital usually include a clinic which provides treatment facilities to children in the community and to patients on the general ward of the hospital. In many hospitals the clinic does not duplicate the community clinics and develops special areas of interest. These areas are usually concerned with the emotional problems of the infant and the pre-school child, and with the emotional aspects of organic disease. Because these clinics serve infants and pre-school children they tend to have an earlier contact with behavioural disorders than do most community clinics.

In certain hospitals inpatient units have been developed to provide for the observation and short-term treatment of behavioural disorders. The patients treated by such a unit usually include a large number of children whose behavioural disorders are secondary to organic disease, either of the central nervous system or general somatic systems. Through the diagnosis and treatment of children with psychosomatic disturbances a very close relationship may develop between psychiatry and general pediatrics.

Certain pediatric hospitals have developed day nurseries or schools for the observation and treatment of emotionally disturbed children, particularly those of pre-school age. In some communities this unit is not part of the hospital, but is administered by a community organization and supervised by the staff of the hospital.

The development of psychiatric facilities in a children's hospital provides almost unlimited opportunities for teaching. The pediatrician in training may learn the early detection of behavioural disorders in children and the techniques of dealing with simple behavioural problems that he will encounter in practice. Psychiatrists in training may be given a wide experience in the problems of childhood, and social workers and psychologists may be assigned to such facilities for training and supervision. The psychiatric department can do a great deal to create a general philosophy in the hospital towards the ill child and his parents. The nursing staff and the attending pediatric staff, as well as nurses and pediatricians in training, will learn the needs of the hospitalized child, the recognition of emotional disturbances in hospitalized children and the relationship of these disturbances to the hospitalization. They will also learn the value of an integrated program of child care which utilizes the services of the occupational therapist, the nursery school staff and the medical social worker.

Such units are ideally suited for research. They are usually situated in a hospital which is carrying out investigation of various problems of childhood. The staff has the opportunity to obtain assistance from other departments of the hospital and to foster research projects which will involve various disciplines. These units are particularly capable of carrying out investigation into those aspects of behaviour which are related to organic or structural disturbances in the central nervous system, mental retardation, cerebral palsy, convulsive disorders, and the like, as well as such psychosomatic disorders as diabetes, celiac disease or asthma.

This issue contains an interesting and instructive series of articles which were presented at the Montreal Children's Hospital on the occasion of the tenth anniversary of the founding of the psychiatric department of that hospital. These articles reveal a diverse approach to the problems of child psychiatry, ranging from the formal psychoanalytic concepts of Melanie Klein and Clifford Scott, to the organic concepts of Loretta Bender. In addition to the development of general psychiatric services, special services have been created including a day treatment centre for emotionally disturbed children, an assessment clinic for the *investigation* and evaluation of children with delayed development and a "learning clinic" to study children with specific problems in learning. This department is indeed to be congratulated upon its achievements

of the past ten years and upon the sound base that it has established for future development.

W.A.H.

INTRAVENOUS UREA IN THE TREATMENT OF HEAD INJURIES

ELEVATION of the intracranial pressure after head injury may result from intracranial hematomas, local or general cerebral edema, hypoxia due to an inadequate airway, obstruction of cerebral venous drainage or the combined effects of edema, hemorrhage and necrosis around brain contusion or laceration. In the past the belief that the phase of stupor and confusion after head injury resulted from raised intracranial pressure, led to the practice of treating patients in this state by measures to promote dehydration, and by nursing the patient with the head raised to decrease intracranial venous pressure. There is now general agreement that intracranial pressure is not increased in the majority of cases of head injury. Therefore, unless it is known that elevation of intracranial pressure does exist, dehydration measures can be of no value and they may increase the risk of biochemical disturbances; similarly the risk of inhalation while nursing an unconscious patient with the head elevated outweighs any potential benefit from improvement of venous drainage.

However, *when the intracranial pressure is demonstrably elevated from causes other than an intracranial clot,* attempts to reduce it may be necessary. In less severe cases, controlled dehydration for two or three days by restriction of fluid intake, together with rectal infusions of saturated magnesium sulfate, are advocated by some, although the value of such measures is doubted by many. Tracheotomy alone, by ensuring the maintenance of a free airway and adequate cerebral oxygenation, may of itself be sufficient to restore intracranial pressure to satisfactory levels in some cases. In those with generalized cerebral edema, hypothermia may also lower intracranial pressure in many cases. Although bony decompression is now performed infrequently in such cases, in those for whom this procedure may be desirable, the brain may be so tight as to make operation technically difficult with a risk of causing additional brain damage by opening the dura.

For many years a rapidly acting effective hypertonic agent has been sought to ameliorate the tension and swelling of the intracranial structures. Intravenous hypertonic (50%) sucrose or quadruple-strength plasma have long been used for this purpose, but their effectiveness leaves much to be desired and their administration may be followed by a secondary or rebound increase in intracranial pressure.

Since 1958, the intravenous administration of hypertonic (30%) urea, as recommended by Javid,[1] has been gaining increasing popularity as a useful measure to reduce brain bulk during neurosurgical operations.

The efficacy of hypertonic urea in the management of a pilot series of patients with severe head injuries has recently been reported by Watkins, Stubbs and Lewin[2] of the Radcliffe Infirmary, Oxford. Among 1046 patients with acute head injuries admitted between March 1959 and May 1960, there were 40 deaths, a mortality rate of 4%. During that period 30 of these patients were given urea, either in a single dose in conjunction with an operative procedure or over a period of several days with the objective of controlling intracranial pressure. All were comatose when treatment was begun and *all had elevated intracranial pressure with a tight brain* as seen at operation.

On the basis of their observations on this group of patients, Watkins *et al.* consider that intravenously administered hypertonic urea is of value (1) to effect reduction in brain bulk due to edema in the presence of an acute subdural hematoma, thus permitting more efficient evacuation of the hematoma and at times rendering bony decompression by means of a bone flap unnecessary; (2) to facilitate operative procedures in cases in which cerebral compression is due to the combined effects of a thin layer of subdural clot and edema around an area of contused or pulped brain which renders the dura so tight that opening it would be hazardous; (3) to reduce generalized cerebral edema; (4) for prompt and effective relief of postoperative cerebral edema after decompression operations (in such cases it is important to be sure that the clot has not re-formed); and (5) in the treatment of the so-called temporal lobe syndrome in which patients with bitemporal contusion remain stuporous, but not unconscious, for several days, with extensor plantar responses and transient pupillary inequalities.

Urea is most effective and its effects persist longer when the elevation of intracranial pressure is due to generalized edema or to localized swelling adjacent to an area of contusion and/or laceration than when it is due to a clot, *per se*. The relatively normal portion of the brain is more susceptible to the effect of urea than is softened, contused or lacerated brain, much of which is devitalized and does not possess the capacity to resist the passage of urea from the blood into the brain tissues.

Urea as used for this purpose is highly hypertonic, and extravasation of even small amounts may result in soft tissue sloughing and necrosis. Other complications encountered include venous thrombosis in the injected limb, circulatory collapse particularly in patients with already diminished cardiac reserve, excessive dehydration and, occasionally, electrolyte disturbances. In addition it must be borne in mind that this form of treatment may so reduce cerebral edema, and thereby so improve the patient's condition, that an underlying intracranial clot may be overlooked.

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The investigators at the Radcliffe Infirmary concluded that urea is the most potent available agent for reducing brain bulk. It is most effective in its action on normal brain as an aid to operative exposure of a local space-taking lesion, traumatic, neoplastic or otherwise, when the greater portion of the brain is undamaged. When intracranial bleeding is continuing or when an intracranial clot is developing or is suspected, urea should not be used except as an immediate preoperative procedure. Nor is it necessary, as a rule, in the presence of a large subdural clot. Otherwise it may be of some value in the management of head injuries as an aid to decompressive procedures, and for long-continued treatment in the small group of patients in whom cerebral edema is the main factor.

It is again emphasized that this agent should not be administered unless there is definite evidence that the intracranial pressure is increased and that a large clot is *not* present. In most cases this involves the performance of burr holes and/or arteriography. Lumbar puncture is a very dangerous procedure in such patients.

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RHEUMATIC FEVER IN THE U.S.S.R.

STUDIES of the incidence of rheumatic fever in children and adults are being conducted in a number of cities in the Soviet Union. Statistical surveys to date have involved 40,000 school-age children among whom the incidence of rheumatic fever was estimated as 1% to 3%. Surveys among workers in certain industrial enterprises in Moscow revealed that some 4% of adults had rheumatic fever or rheumatic heart disease. Although statistical studies from various European countries and America indicate that there has been a significant reduction in the incidence of rheumatic fever in recent years, the Ministry of Health of the U.S.S.R. has as yet no reliable statistics to establish that such a decrease has occurred in the Soviet Union, although indications are that there has been some such reduction. These and other aspects of the current status of rheumatic fever in the U.S.S.R. have recently been reviewed in a comprehensive manner by Professor Nesterov of the Soviet Academy of Medical Sciences, Moscow (*Terapevticheskyi Archiv.*, No. 8: 5, 1960).

There is general agreement between the views of Soviet rheumatologists and their western colleagues regarding the etiology and pathogenesis of rheumatic fever. Long-term prophylaxis with benzathine penicillin G in the spring and fall has been accepted practice in rheumatic disease centres in various cities in Russia, and the recommendations of the Third European Congress of Rheumatology (1955) have also been incorporated in the regulations regarding treatment and prevention of rheumatic fever in the U.S.S.R.

Nesterov reviews various aspects of research in rheumatic fever pathogenesis currently under study in the Soviet Union. Extension of the ideas of Pavlov and Botkin towards a "systemic, generalized concept of disease" led Soviet clinicians to regard rheumatic fever as a visceral disease with localization in connective tissue of various organs together with "disordered function of the nervous and neurohormonal systems". Investigation is also being carried out on the polysaccharides of cardiac connective tissue. Immunological and biochemical characteristics of the rheumatic process are utilized to differentiate rheumatic fever from infective arthritis and from other collagen diseases. Soviet workers have demonstrated that antistreptolysin-O titres, antihyaluronidase, antistreptokinase and C-reactive protein all show changes in keeping with the stage of the disease. [The limited value of these procedures in diagnosis or as an index of disease activity, has been common knowledge for several years—ED.] Corticosteroids are recommended by leading Soviet clinicians as the treatment of choice for acute rheumatic fever. Hospitalization during the active stage of the disease is mandatory and should continue until all evidence of activity has abated. Re-admission is recommended for reactivation of the disease, and patients should be supervised after discharge from hospital.

Preventive measures include education of the population in general hygiene and better nutrition, intensive programs to reduce streptococcal infections, and registration of all patients with rheumatic fever and tonsillitis. Yearly examination of all students for evidence of rheumatic fever and pharyngo-tonsillitis is recommended. Susceptible persons should be given benzathine penicillin G in the spring and fall, together with other "antirheumatic" drugs such as aminopyrin or aspirin. [The prophylactic value of aminopyrine or aspirin is not recognized generally in so-called "western" nations—ED.]

Doctors should be instructed thoroughly in the early diagnosis of rheumatic fever, and hospitals and other medical institutions should be provided with up-to-date means of combating the disease.

While there may be little in this account that is new to Canadian doctors regarding the treatment or prophylaxis of rheumatic fever, Professor Nesterov's report gives the impression that with all the emphasis on preventive measures that appears to permeate modern Soviet medicine, and in a country with strict government control of health services, the organization of preventive measures for such a classical public health problem as rheumatic fever could scarcely be considered to be in an advanced state. Whether rheumatic fever prevalence is not decreasing in the U.S.S.R. parallel to its decrease in western nations; and if such is the case, whether or not it is related directly or indirectly to socio-economic conditions, are matters for speculation.

W.G.

LETTERS TO THE EDITOR

STRABISMUS AS A COMPLICATION OF INFLUENZA

To the Editor:

Although influenzal or postinfluenzal ophthalmoplegias are not common, the larger works on ophthalmology contain several references to this condition, the occurrence of which was reported in a recent issue by Adler (*Canad. M. A. J.*, 84: 555, 1961).

The 6th nerve is usually involved either unilaterally or bilaterally (Badal and Fage, 1890; Coppez, 1890; Sattler, 1890; Albrand, 1892; Kollner, 1908; and others). The 3rd nerve may also be affected in varying degrees (Pfluger, 1890; van der Bergh, 1890; Juler, 1898); and the 4th nerve rarely (Pfluger, 1890). Gessner (1908) reported a total 3rd and 4th palsy.

Chavasse reported a case of abducens palsy as follows: "After an attack of influenza in a child a left sixth paresis developed. The condition showed a variable primary deviation, a more marked secondary deviation, and restriction of levoversion compared with dextroversion. Complete recovery occurred in ten weeks."

In Duke-Elder's "Textbook of Ophthalmology", Fig. 3522 on page 4099 shows a composite picture of all the stages of Chavasse's case.

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To the Editor:

In the March 11 issue of the Journal (84: 555, 1961), Dr. K. Adler, M.O.H. for the Chinook Health Unit, Blairmore, Alberta, reported his observation of strabismus in influenza and it was suggested that such may not have been previously reported. Actually such occurrences have been reported. The cases of squint observed by Dr. Adler may be explained on one or other of the following bases.

Firstly, ocular palsies causing a transient paralytic type of strabismus together with a long list of other alleged ocular complications including retrobulbar neuritis, papillitis, vitreous hemorrhage, keratitis, conjunctivitis, lid abscesses, dacryoadenitis, dacryocystitis and even orbital cellulitis, have all been reported in influenza. Some of these, however, were exclusively associated with the septicemic type of the disease which was epidemic in this country in 1918-19. We have observed such types of ocular palsies of relatively short (few weeks) duration occur in several different disease conditions, including infectious diseases. Since influenza as an entity is such a clinical hodge-podge, such an occurrence in conditions tagged with this diagnosis is not particularly surprising.

Secondly, one must consider in such young children the likelihood of such a transient squint having been, in effect, a so-called latent heterotropia (or marked heterophoria) made manifest as a result of the debilitating illness which one might say acted as a triggering mechanism. This is not of uncommon occurrence and accounts for the frequency with which the onset of a strabismus is associated in the minds of the parents with some or other childhood disease, notably one of the exanthemata or other febrile illness, when in effect such has only served to make manifest a previously incipient or latent heterotropia. With the passing of the illness this might quite understandably revert once again, for a greater or lesser length of time, to a latent heterotropia (or heterophoria), with, of course, resumption of fusion of the visual axes. Ophthalmological investigation, including orthoptic analysis, should be carried out in such cases.

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INTRAVENOUS FIBRINOLYSIN IN THE TREATMENT OF INTRAVASCULAR THROMBOSIS

To the Editor:

In agreement with Drs. Watt and MacMillan, I think that it would be more exact to say that Dr. Moser's figures "contrast with" rather than "refute" theirs. As to the beneficial results I mentioned, subjective improvement within a few hours and objective improvement within 12-24 hours could in each case have happened in the natural course of events, but this would constitute a remarkable series of coincidences. Short of averting a fatal outcome, I am at present under the impression that fibrinolysin, in those cases which appear to respond, improves the lot of the patient and shortens hospital stay; if the last point be valid, this would offset the cost of the therapy.

I have observed three further cases since my previous letter. (1) An elderly obese woman with extensive varices and with acute superficial thrombophlebitis in whom fibrinolysin had no obvious effect. (2) A young woman in whom the diagnosis of cavernous sinus thrombosis was in dispute; again, fibrinolysin could not be said positively to have helped because thrombosis was not certain and because improvement coincided also with surgical measures and with the use of antibiotics. (3) Lastly, a man in his forties with femoral thrombosis who appeared rapidly to respond, who developed signs in his lower leg a few days later when Danilone control slipped to an inadequate level and who again appeared to derive benefit from a further infusion of fibrinolysin. No untoward reactions were observed in these cases.

It will take a "statistically significant" series of cases to prove whether or not fibrinolysin reduces the mortality rate of appropriate conditions. Until such is forthcoming, I shall keep an open mind. So far, my experience leads me to take a positive and optimistic attitude with desire to add to that experience. Certainly, I have so far encountered no undesirable effects which might give me pause.

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MEDICAL NEWS IN BRIEF

POSTURAL TREATMENT OF PARTIAL THORACIC STOMACH

A study was made of the value and limitations of postural treatment in the management of children with a partial thoracic stomach uncomplicated by an esophageal stricture. The clinical progress of treated patients was compared with the expected outcome as determined from a previous study of the natural history. All patients were followed up to at least four years of age. Carré (*Arch. Dis. Child.*, 35: 569, 1960) concludes that postural treatment is of great value in the management of these patients. For the attainment of maximum benefit it was necessary, however, that patients be sat up at 60 degrees or more throughout the 24 hours. This degree of propping can only be maintained by using some form of supportive harness or chair. Treatment should be continued for up to 12 months should troublesome symptoms persist.

The most favourable clinical results were recorded in patients aged less than three months when started on treatment; 30 of 34 so treated were virtually symptom-free at one year of age. On the other hand only about one-half of the older patients improved. As supplementary treatment, thickened feeds were found to be of unquestionable benefit. The value of alkali could not be accurately ascertained, though the available evidence suggests that this therapy was also helpful. The only significant complication of treatment was the development of a "flat" head in a few patients. This alteration in head shape was confined to children who were started on treatment when under three months of age and maintained continuously in a sitting posture for at least one month.

STUDIES OF IMMUNOLOGICAL DIFFERENCES IN SERA OF NORMAL AND CARCINOMA-BEARING MICE

Malignant tumours growing in vertebrates may be expected to produce immunologically detectable effects in the circulating plasma either by abnormal penetration into the blood stream of antigenic substances from the tumour itself or as a result of abnormal influences by the tumour on the functions of organs or tissues that do not normally release their products into the circulation.

In 1955 Darcy reported the immunization of rabbits with sera of rats bearing the transplantable Walker carcinoma. Using the Ouchterlony gel diffusion technique evidence of a precipitin reaction between the immune rabbit serum and the cancer-bearing rat serum was demonstrable. This was not present when normal rat serum was used. Darcy also found, however, that the same reaction was obtained with serum from rats that had been tightly bandaged about the abdomen and had not been fasted before bleeding. Subsequently Darcy reported on other precipitin lines obtained with both normal and cancer sera, but exclusively with neither. In particular, one antigen, a mucoprotein present in normal rat serum, appeared to increase greatly in concentration while a tumour was developing or when non-cancerous rats were growing or regenerating their tissues. In these reports, reference was made to similar changes found in the sera of human patients with carcinoma but these changes or others resembling them could also be observed in sera from some patients with non-neoplastic diseases.

In studies designed, in particular, to demonstrate the presence of any specific or characteristic carcinoma antigen, Hackett and Lawson, at the Institute of Medical and Veterinary Science, Adelaide, Australia (*M. J. Australia*, 2: 896, 1960), immunized rabbits with the sera of mice bearing the transplantable Ehrlich ascites mouse carcinoma. Mice with other irritant lesions, and pregnant mice, were used as controls. The Ouchterlony agar-gel diffusion technique was used in these serological investigations. No specific or characteristic antigen was found in the tumour-bearing animals. Certain differences in antigenicity between the sera of normal mice and the sera of mice with cancer, or in a state of gross physical disturbance, suggested that antigens present only in haptenic or simplified molecular form in the normal sera were to be found as complete antigens in the blood of the abnormal mice.

EXPERIENCES WITH FLUORIDATION IN MOOSE JAW

A dental survey of 1078 children in Moose Jaw, Saskatchewan, was conducted and reported in 1952 before fluoridation of the municipal water supply was instituted. In 1953, fluoridation was commenced and has continued, except for a period of 15 months in the years 1955 and 1956. Also, for three months after the resumption of fluoridation, the desired concentration of 1 p.p.m. was not achieved during changeover of the source of water supply. In 1959 a further survey of 1261 children enrolled in 11 public schools was carried out by the same technique as the 1952 survey (Chegwin, A. E., *Canad. J. Pub. Health*, 52: 10, 1961). Results of the two surveys were interpreted as indicating that fluoridation had improved the dental health of Moose Jaw children by preventing considerable tooth decay at very little cost to the community. There was no evidence of any ill effect upon any member of the community of any age group. It was considered that transient periods during which the water possessed objectionable colour and taste were not related to the presence of fluoride but were due to factors associated with the source of water supply and methods of purification treatment.

Of interest in this survey was the observation that there were a number of children with extremely high rates of dental decay, referred to as "hyper-susceptibles", who gain nothing by the ingestion of fluoride and for whom explanation of their excessive dental breakdown must be sought.

It was also observed that the data in this report closely parallel the experience in Brantford, Ontario, which commenced fluoridation in 1945 and was surveyed annually by the dental consultant of the Department of National Health and Welfare, for a 10-year period. It was predicted that in a further 10 years greater improvement in dental health of the school children in Moose Jaw will be experienced, which could be in excess of double the improvement already in evidence — a reduction of the number of decayed teeth as high as 65% for all ages.

GLAUCOMA CONTROL

The recognition of glaucoma as a public health problem has been gaining momentum in recent years. Its eminence as a major cause of preventable blindness has been further emphasized by the increase in life expectancy with a corresponding increase in the proportion of the population in the higher age groups — the glaucoma age groups. Glaucoma has been reported responsible for 11% of blindness in Canada and it is estimated that there are probably over 100,000 Canadians with this disease.

Primary glaucoma is a major cause of blindness and occurs in 2% of people over the age of 40 years. Early treatment, complemented by an effective case-finding program, is essential in achieving control in simple glaucoma. The best chance of clinical control has been missed if the patient does not receive treatment until he seeks medical advice because of failing vision. Mass screening for glaucoma is a valuable case-finding procedure with important educational value as well.

A long-range control program would include various approaches, such as: (a) A sustained program of routine screening in industry and in selected population groups where extra hazard exists (e.g. older citizens and relatives of persons with glaucoma). (b) An expanded program of glaucoma clinics with a selective extension of clinic activity into the field of case finding. (c) The instruction of medical undergraduates in the technique of tonometry, and (d) the routine use of tonometry by general physicians in the examination of patients over 40 years of age.

While this problem is national in scope, the development of a control program requires the initiative and co-operation of interested groups, professional and otherwise, at community level (Hoffman, O., *Canad. J. Pub. Health*, 52: 23, 1961).

(Continued on advertising page 32)

Medical News from Parliament

A Private Member's Bill was introduced on February 28 by Dr. George Fairfield, M.P., Portage-Neepawa, to incorporate the International Brain Research Organization. This is an international association of neurologists which will act as a clearing-house and exchange centre for information. It stems from a resolution passed at a meeting of brain research scientists in Moscow in 1958. It will be associated with the United Nation's Educational, Scientific and Cultural Organizations (UNESCO). All parties in the House gave their approval. Other physician-members speaking to the motion were Dr. J. E. Bissonette (Quebec West) and Dr. P. B. Rynard (Simcoe West).

Further reports by the Minister of Justice, the Honourable Davie Fulton, on investigations by the Combines Branch into drug prices indicate that the Combines Branch have now handed in their report. There is speculation here that public inquiries across the country into drug prices may follow. This might be done by the Combines Branch or it might be part of the terms of reference to the Royal Commission on Health Services.

On February 27, the Minister of Health and Welfare, the Honourable J. W. Monteith, announced the community-wide testing of oral poliovirus vaccine in Prince Albert, Sask., and Wedgeport, N.S. The new vaccine manufactured in Canada is of the Sabin type, similar to that which has been used in other parts of the world.

Within Parliament there is a Voluntary Committee on Health—made up of M.P.s and Senators. Dr. P. B. Rynard, M.P. for Simcoe, is Chairman. All other doctor M.P.s serve on the Committee. The history of this committee goes back to the early nineteen hundreds when Dr. Gordon Bates, who is now Director of the Health League of Canada, enlisted the help of M.P.s to set it up.

Through the years the Voluntary Committee has done a good job of making M.P.s and Senators aware of the health needs of Canadians. It was as a result of their efforts that the Federal Department of Health was formed in 1919.

The Committee holds meetings about four times a Session and has tried to bring distinguished members of the health field to speak to Members and Senators on topics of current health interest. Over the past year or two, luncheon meetings of the Committee have been addressed by such distinguished medical men as Dr. Brock Chisholm, Dr. Wilder Penfield, Dr. Bates and just recently Dr. Harry Ebbs.

Recently through the courtesy of Shell Oil we were able to bring the Committee two very good films on health questions in other parts of the world. The films "Unseen Enemies" and "Rival Worlds" give a very vivid picture of the fight which is still going on and must continue to go on if disease is to be conquered. These films were produced in Africa and show the battle which the World Health Organization is waging against disease, filth and ignorance. They are available for showing from the Health League of Canada, 111 Avenue Road, Toronto 5, Ont., and should be ideal for community showing, even though they have a strong emotional content.

H. M. HORNER, M.P.,
Jasper-Edson.

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PRELIMINARY PROGRAM

FOR THE

94th ANNUAL MEETING

OF

The Canadian Medical Association

MONTREAL, QUEBEC

June 19 - 23, 1961

The 94th Annual Meeting of The Canadian Medical Association will be held at Montreal, Quebec, Monday, June 19 through Friday, June 23, 1961. Convention headquarters will be The Queen Elizabeth Hotel. The timetable of the scientific sessions and social events will be as follows:

Monday, June 19 Tuesday, June 20 Wednesday (morning only), June 21	Meeting of The General Council
Monday, June 19	12.30 p.m.—Luncheon for Members of The General Council 7.00 p.m.—Wine-Tasting Supper Party, Museum of Fine Arts
Tuesday, June 20	9.00 a.m. - 4.45 p.m.—Scientific Sessions 7.00 p.m.—Dinner to The General Council
Wednesday, June 21	9.00 a.m. - 4.45 p.m.—Scientific Sessions 12.30 p.m.—Luncheon and Annual Meeting of the Quebec Division 8.15 p.m.—The Annual General Meeting President's reception and dance
Thursday, June 22	9.00 a.m. - 4.45 p.m.—Scientific Sessions Golf Tournament in afternoon 6.00 p.m.—Civic Reception at The Chalet
Friday, June 23	9.00 a.m. - 5.00 p.m.—Program on Medical Economics

A feature of the meeting this year will be a showing of medical films Tuesday through Thursday and a number of Scientific Exhibits.

PRELIMINARY SCIENTIFIC PROGRAM

Tuesday, June 20

TEACHING SESSIONS

9.00 - 10.30 a.m.

Some Interesting Aspects of Endocrinology and Nutrition

Chairman:

DR. D. R. WILSON, Edmonton

Participants:

DR. P. B. ROSE, Edmonton
DR. CHARLES HOLLENBURG, Montreal
DR. JACQUES DUCHARME, Montreal

The Acute Abdomen

Chairman:

DR. A. D. MCKENZIE, Vancouver

Participants:

DR. J. G. HOWLETT, Montreal
DR. R. A. H. KINCH, London
DR. J. R. F. MILLS, Toronto
DR. L. MORISSETTE, Montreal

10.45 a.m. - 12.15 p.m.

Chronic Respiratory Disease, Its Diagnosis and Management

Chairman:

DR. RONALD V. CHRISTIE, Montreal

Participants:

DR. D. V. BATES, Montreal
DR. J. A. P. PARE, Montreal
DR. R. G. FRASER, Montreal

Practical Problems in Intravenous Supportive Therapy

Chairman:

DR. FRASER N. GURD, Montreal

Participants:

DR. R. A. MACBETH, Edmonton
DR. JOHN C. BECK, Montreal
DR. EUDORE SAVOIE, Montreal

2.00 - 3.30 p.m.

Prenatal Care

Chairman:

DR. B. D. BEST, Winnipeg

Participants:

DR. W. R. FOOTE, Montreal
DR. F. J. TWEEDIE, Montreal
DR. P. A. RECHNITZER, London
DR. O. A. SCHMIDT, Winnipeg

Hypertension — Atherosclerosis

Chairman:
DR. JACQUES GENEST, Montreal

Participants:
DR. LOUIS HORLICK, Saskatoon
DR. JOHN A. LEWIS, London
DR. W. FORD CONNELL, Kingston
DR. JOHN D. MORROW, Toronto
DR. A. E. THOMSON, Winnipeg

SECTION OF GASTROENTEROLOGY

9.00 a.m.

Chairman: DR. R. D. MCKENNA, Montreal

Business meeting followed by six ten-minute papers on experimental work in Gastroenterology.

2.00 - 5.00 p.m.

The Diagnosis and Management of Hiatus Hernia and Esophagitis

Chairman:
DR. R. C. DICKSON, Halifax

Participants:
DR. R. G. FRASER, Montreal
DR. D. D. MUNRO, Montreal
DR. C. M. BALLEM, Montreal

Evaluation of Current Diagnostic Methods in Diseases of the Digestive Tract

Chairman:
DR. A. BOGOCH, Vancouver

Participants:
DR. A. JUTRAS, Montreal
DR. J. SIDOROV, Halifax
DR. P. LETENDRE, Montreal
DR. J. M. FINLAY, Toronto
DR. D. J. BUCHAN, Saskatoon
DR. P. M. O'SULLIVAN, Toronto

Wednesday, June 21

TEACHING SESSIONS

9.00 - 10.30 a.m.

The Value of Anticoagulant Therapy

Chairman:
DR. K. J. R. WIGHTMAN, Toronto

Participants:
DR. PAUL DAVID, Montreal
DR. H. J. M. BARNETT, Toronto
DR. LOUIS HORLICK, Saskatoon

The Management of Peripheral Venous Thrombosis

Chairman:
DR. JAMES A. KEY, Toronto

Participants:
DR. J. C. LUKE, Montreal
DR. T. S. PERRETT, Vancouver
DR. K. W. G. BROWN, Toronto
DR. J. G. QUENNEVILLE, Montreal
DR. D. R. WILSON, Toronto

The Significance and Management of Rectal Bleeding

Chairman:
DR. IAN MACKENZIE, Halifax

Participants:
DR. R. A. MUSTARD, Toronto
DR. JACQUES BRUNEAU, Montreal
DR. IVAN T. BECK, Montreal
DR. ARNOLD ROGERS, Winnipeg
DR. CHARLES BIRO, Saskatoon

10.45 a.m. - 12.15 p.m.

The Recognition and Office Management of Minor Psychiatric Disorders

Chairman:
DR. GORDON A. COPPING, Montreal

Participants:
DR. K. A. YONGE, Edmonton
DR. PETER G. EDGELL, Montreal
DR. HEINZ E. LEHMANN, Montreal
DR. FRANÇOIS CLOUTIER, Montreal

The Early Management of Injuries

Chairman:
DR. W. MASON COUPER, Montreal

Participants to be announced

Allergy and Collagen Diseases

Chairman:
DR. JACQUES LEGER, Montreal

Participants to be announced

GENERAL SESSION

Chairman: DR. R. MACGREGOR PARSONS, Red Deer

2.00 - 3.00 p.m.

Paper on Psychiatry
DR. D. EWEN CAMERON, Montreal

The Effect of X-Ray Radiation on the Embryo-Fetus
DR. MAURICE MAYER, Paris, France

TEACHING SESSIONS

3.15 - 4.30 p.m.

The Management of Urinary Infection

Chairman:
DR. J. M. CAMPBELL, Saskatoon

Participants:
DR. DOUGLAS G. CAMERON, Montreal
DR. HARRY MEDOVY, Winnipeg
DR. ROBERT D. JEFFS, Toronto

Deafness, Its Diagnosis and Management

Chairman:
DR. FERNAND MONTREUIL, Montreal

Participants to be announced

Thursday, June 22

TEACHING SESSIONS

9.00 - 10.30 a.m.

Case Analysis Clinic

Chairman:
DR. H. ROCKE ROBERTSON, Montreal

Participants:
DR. A. D. MCKENZIE, Vancouver
DR. R. C. HARRISON, Edmonton
DR. J. C. LUKE, Montreal

Clinical Pathological Conference

Chairman:
DR. DOUGLAS G. CAMERON, Montreal

Participants to be announced

Emergencies in the Newborn

Chairman:
DR. HARRY MEDOVY, Winnipeg

Participants:
DR. CLINTON A. STEPHENS, Toronto
DR. R. A. USHER, Montreal
DR. JOHN M. BOWMAN, Winnipeg

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GENERAL SESSION

Chairman: DR. G. W. HALPENNY, Montreal

11.00 a.m. - 12.15 p.m.

The Lister Lecture: Biliary Surgery in Sweden
DR. HUGO ROSENQVIST, Stockholm, Sweden

The Medical Research Council
DR. R. F. FARQUHARSON, Toronto

Chairman: DR. H. S. MORTON, Montreal

2.00 - 3.00 p.m.

Iatrogenic Hazards in Anesthesia
DR. LEROY D. VANDAM, Boston

Transient Cerebral Ischemia
DR. CHARLES M. FISHER, Boston

TEACHING SESSIONS

3.10 - 4.45 p.m.

New Concepts of Infectious Diseases of Childhood

Chairman:
DR. JULES CHARBONNEAU, Montreal

Participants:
DR. A. R. FOLEY, Quebec
DR. VICTOR MARCHESSAULT, Montreal
DR. VYTAUTAS PAVILANIS, Montreal
DR. CRAWFORD S. ANGLIN, Toronto

Dysmenorrhea

Co-Chairmen:
DR. GEORGE B. MAUGHAN, Montreal
DR. PIERRE MEUNIER, Montreal

Participants:
DR. ELINOR F. E. BLACK, Winnipeg
DR. PAUL DUMAS, Montreal
DR. JOHN S. HENRY, JR., Montreal
DR. E. H. SHABANAH, Montreal

Radiation Protection in Diagnostic Radiology and in Industry

Chairman:
DR. D. L. MCRAE, Montreal

Participants:
DR. R. C. BURR, Kingston
DR. ALBERT JUTRAS, Montreal
(Other participants to be announced)

Friday, June 23

PROGRAM ON MEDICAL ECONOMICS

Chairman: DR. J. A. MCMILLAN, Charlottetown

9.00 -10.15 a.m.

The Effect of Universal Hospital Insurance on Medical Practice

Chairman:
DR. JOSEPH A. MACDOUGALL, Saint John

Participants to be announced

10.30 a.m. - 12.00 noon

Government and Medicine
DR. WILDER G. PENFIELD, Montreal

Health Insurance in Australia
DR. T. J. QUINTIN, Sherbrooke

Health Insurance in Sweden
DR. HUGO ROSENQVIST, Stockholm, Sweden

2.00 - 5.00 p.m.

The Role of the Royal Commission on Health Services
HONOURABLE EMMETT M. HALL, Regina

Existing Deficiencies in Health Services—The Saskatchewan Experience
DR. H. D. DALGLEISH, Saskatoon

The Ideal Health Insurance Program for Canadians

Chairman:
DR. G. E. WODEHOUSE, Toronto

Participants to be announced

THE SOCIAL PROGRAM

The Planning Committees in Montreal have also arranged a number of interesting social events, which will commence on Monday evening, June 19, when members and their wives will participate in a wine-tasting supper party. This event will take place in the Museum of Fine Arts, and those present will have the opportunity of tasting some twelve different imported wines accompanied by a similar number of cheeses. The meal will be rounded out with special hors d'oeuvres and pastries. On Tuesday evening, the Annual Dinner to The General Council will take place in the Ballroom of the Queen Elizabeth Hotel, and special musical entertainment has been arranged for this occasion. All are invited. The highlight of our convention week will be the Annual General Meeting, which will commence at 8.15 p.m. on Wednesday, June 21. At this time the colourful ceremony of the installation of the President will take place; and His Excellency Major-General Georges P. Vanier, D.S.O., M.C., C.D., Governor General of Canada, will be made an honorary member of the C.M.A. It is interesting to note that this is only the third time in the history of the C.M.A. that a non-medical person has been awarded this honour. The other two honorary memberships were presented to the Right Honourable Vincent Massey, former Governor General of Canada; and His Royal Highness The Prince Philip, Duke of Edinburgh. In addition to the above, the Canadian Medical Association will honour its Senior Members who have been nominated by their respective Divisions.

Details of the ladies' program will appear in a later issue of the Journal along with other program highlights.

HOUSING APPLICATION FORM

The Canadian Medical Association

94th ANNUAL MEETING - June 19 - 23, 1961

MONTREAL, QUEBEC

[Hotels and motels in Montreal, with their rates, are listed on page 348 of the issue of February 11]

Apply direct to the:

Reservations Manager,

Hotel.....

Address.....

Please reserve the following accommodation (check): (All rooms have baths and/or showers.)

Single bedroom..... Twin bedroom.....

Suites for one person (bedroom and parlour).....

Suites for two persons (bedroom and parlour).....

Suites for four persons (2 bedrooms and parlour).....

Family Plan—no charge for children under 14.....

In view of the large attendance expected, it might be to your advantage to share a room with another member. Please mention below the names of the persons with whom you would like to share your accommodation; otherwise assignment will be suggested by the Committee on Arrangements.

I (we) will arrive in Montreal on June.....at.....A.M.....P.M.

I (we) will depart from Montreal on June.....at.....A.M.....P.M.

Travelling by: Air..... Train..... Automobile.....

NAMES OF PERSONS OCCUPYING ACCOMMODATION REQUESTED ABOVE:

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ADDRESS(ES).....

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TELEPHONE No.....

N.B.—Confirmation of housing will be made direct from hotel or motel.

THIS WILL CONSTITUTE YOUR ADVANCE REGISTRATION FOR THE MEETING.

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EDUCATION FOR PHYSICAL FITNESS

On March 4 and 5, twelve key physical educationists representing the Canadian Association for Health, Physical Education and Recreation, and eleven representatives of the Canadian Medical Association's Divisions participated in a joint conference on physical fitness. The meeting was held at C.M.A. House in Toronto. In addition to the official conference participants, several observers from both professions were present.

This first joint conference was held to determine ways and means whereby the two associations might work together to improve the physical fitness and recreation programs for Canadians. Discussions centred on the pre-school child; the school child to puberty; the adolescent; and the adult.

Dr. G. E. Duff Wilson, Kitchener, Chairman of the C.M.A. Committee on Public Health, was co-chairman of the conference along with Mr. Gordon A. Wright, President of the C.A.H.P.E.R. Other officials from both professions, apart from the speakers, included: Dr. Harry Ebbs, Toronto, Director, School of Physical and Health Education, University of Toronto; Mr. C. R. Blackstock, Toronto, Executive Director, C.A.H.P.E.R.; and Dr. A. F. W. Peart, Deputy General Secretary, C.M.A.

Conference Officials.

Left to right: Dr. A. F. W. Peart, Deputy General Secretary, C.M.A., Toronto; Mr. Gordon A. Wright, President, C.A.H.P.E.R., Toronto; Mr. C. R. Blackstock, Executive Director, C.A.H.P.E.R., Toronto; Dr. G. E. Duff Wilson, Chairman, C.M.A. Committee on Public Health, Kitchener; and Dr. H. Ebbs, Director, School of Physical and Health Education, University of Toronto.

Pre-School Study Group.

Left to right: Dr. E. A. Watkinson, Department of National Health and Welfare, Ottawa; Miss Thelma Gerstman, Assistant Professor, Physical Education, Memorial University of Newfoundland, St. John's; Dr. C. K. Rowan-Legg, Medical Representative, Ottawa; Dr. J. C. Theriault, Medical Representative, Charlottetown; Miss Alice Trevis, Secretary, Physical and Health Education, Y.W.C.A., Toronto; and Mr. W. J. L'Heureux, Director, School of Physical Education, University of Western Ontario, London.

The School Child to Puberty Study Group.

Left to right: Dr. Reba Willits, Medical Representative, Vancouver; Mrs. Mary Liddell, Supervisor, Physical Education, Etobicoke Board of Education, Toronto; Dr. M. Avren, Medical Representative, Winnipeg; Dr. Mary Southern-Holt, Director, Maternal and Child Health, Fredericton, N.B.; Dr. Doris W. Plewes, Consultant, Fitness and Recreation, Department of National Health and Welfare, Ottawa; Mr. Sidney Chapman, Assistant Director, Physical Education, Winnipeg School Division No. 1, Winnipeg.

Adolescent Study Group.

Left to right: Miss Ella Sexton, Inspector, Special Services, Department of Education, Toronto; Dr. S. A. Davidson, Director, Physical Education, Outremont High School, Montreal; Dr. S. Landa, Medical Representative, Saskatoon; Mr. Frank Hayden, Research Associate, University of Toronto; Mr. M. Yuhasz, University of Western Ontario, London; Dr. Maxwell Howell, Assistant Professor, School of Physical Education, University of British Columbia, Vancouver.

Adult Study Group.

Left to right: Dr. R. S. Fraser, Medical Representative, Edmonton; Miss Elsie McFarland, Supervisor, Community Recreation Bureau, Government of Alberta, Edmonton; Dr. A. H. Shears, Medical Representative, Halifax; Dr. Charlotte M. Horner, Medical Representative, Cobourg; Father M. Montpetit, Director, Institute of Physical Education, University of Ottawa, Ottawa; Mr. Hugh Noble, Director, Physical Fitness Branch, Department of Education, Halifax; Dr. Paul Hauch, Medical Representative, London, Ont.

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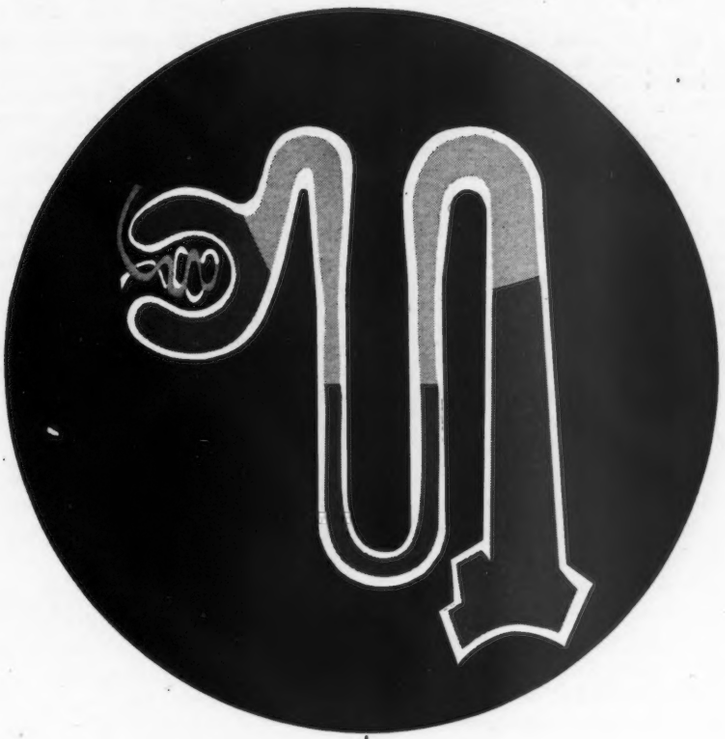

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HYDROCHLOROTHIAZIDE
acts mainly in the proximal segments of the renal tubules.

ALDACTONE® (spironolactone)
acts mainly in the distal segments of the renal tubules.

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ALDACTAZIDE now offers physicians the only therapeutic preparation to provide positive diuretic activity in both the *proximal* and the *distal* segments of the renal tubules.

Hydrochlorothiazide exerts a well-known, vigorous diuretic action in the *proximal* segment of the renal tubules. The Aldactone component of Aldactazide specifically blocks the sodium-retaining and potassium-excreting effect of aldosterone in the *distal* segment.

This combined control provides true multiple diuretic effects for optimal relief of edema and ascites in patients requiring prompt, maximal control, and in those whose edema and ascites are resistant to single diuretics. Further, the potassium-saving activity in Aldactazide largely or wholly offsets the danger of potassium loss which thiazide diuretics induce.

The usual *adult* dose of Aldactazide is one tablet four times daily, although dosage may range from one to eight tablets daily.

Aldactazide is supplied as compression-coated white tablets, each tablet containing 75 mg. of Aldactone (brand of spironolactone) and 25 mg. of hydrochlorothiazide.

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Research in the Service of Medicine

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BOOK REVIEWS

MODERN TRENDS IN UROLOGY. 2nd series. Edited by Sir Eric Riches. 276 pp. Illust. Butterworth & Co. (Publishers) Ltd., London; Butterworth & Co. (Canada) Ltd., Toronto, 1960. $14.00.

The first volume of this work was indeed excellent and was exceptionally well received by urologists in Canada and the United States. It is next to impossible to summarize all of the contents of this second volume. Sir Eric Riches himself has written three of the 25 chapters. Of special interest is a summary of results in the treatment of bladder carcinoma. In the series quoted, 40% of extensive papillary tumours were cured by total cystectomy. The clarity of presentation in this chapter on carcinoma of the bladder is to be commended. The reader is left, however, with the age-old problem concerning choice of treatment for patients with bladder carcinoma.

Enlargement of bladder capacity by ileocystoplasty and by colocystoplasty is fully discussed from the viewpoints of indications and actual operative technique. Late results in a significantly large series of cases are presented.

Renal transplantation is thoroughly discussed from experimental as well as clinical aspects. All of the problems encountered in renal transplantation in human beings, including those of actual operative technique, are described.

A chapter is devoted to the role of surgery in the present-day treatment of renal tuberculosis. This is of considerable interest at the present time.

Leading authorities in genitourinary pathology describe the common neoplasms of the renal pelvis, testicular tumours and prostatitis. The subject of hyperfunctioning adrenal cortical tumours is discussed thoroughly and concisely.

The problem of male infertility, a phase of urology which at times seems to be neglected, is presented in a helpful manner.

Renal biopsy is discussed and its hazards are pointed out. The complications of this seemingly innocuous procedure have been dramatically brought to the attention of the urologist from time to time.

All in all, the reviewer found this book most fascinating in its entirety. It is recommended highly to all with an interest in the recent advances in urological science.

MEDICAL SUPERVISION IN RADIATION WORK; Second Report of the Expert Committee on Radiation. World Health Organization: Technical Report Series No. 196, 1960. 31 pages. Price 1/9, $.30, Sw. fr. 1.--. Also available in French and Spanish.

The health hazards of ionizing radiation have been studied in greater detail than those of any other injurious physical or chemical agents commonly encountered in modern life, and the occupational health record of establishments engaged in radiation work is unrivalled by that of any other industry. Nevertheless, if this standard is to be maintained, improvements in medical supervision will have to keep pace with the rapidly increasing uses of radioactive substances and developments in nuclear energy. The second report of the WHO Expert Committee on Radiation is intended to serve as a guide to those engaged in reviewing or establishing health programs for the protection of radiation workers.

For protection to be adequate, there must be the fullest possible co-operation between the physician responsible for the medical aspects of the program, the physicists and chemists concerned with the measurement of radiation levels, and the biologists studying the effects of radiation and the behaviour of radioactive materials in the body. Depending upon the type of work being performed and the kinds and quantity of the radiation in the working environment, it should be possible to determine the hazards to which the employees are exposed and to devise suitable protective measures. The major categories of radiation work discussed in the report are medical radiology using x-ray equipment and sealed sources of radium and cobalt; the investigation and treatment of disease by means of radioisotopes; industrial uses of radiography and radioisotopes; research uses of radiation and radioisotopes; and atomic energy activities.

Regular medical and other examinations as part of a program to ensure a healthy working force and to detect any physiological and pathological effects of exposure to radiation are a first essential in any health protection program, and prompt and effective medical care must be provided for occupational injury or disease. The report discusses at length the role of the physician and his staff, as well as the selection of personnel for radiation work, an important consideration if hazards are to be kept to a minimum. The objectives of medical examinations are discussed and a number of useful laboratory procedures reviewed. Certain recommendations are made relating to the keeping of medical records: it is essential that they should be accurate, complete and well organized, and that their confidential nature should be closely guarded. Some indications are also given regarding the medical facilities suitable for different types of establishment engaged in radiation work, with particular reference to decontamination facilities. The report concludes with a few brief hints on the preliminary management of radiation casualties.

LIGHT COAGULATION. Gerd Meyer-Schwickerath. Translated by Stephen M. Drance. 114 pp. Illust. The C. V. Mosby Company, St. Louis, Mo., 1960. $9.50.

The need for extensive surgical manipulation of eyes in certain conditions has long been a problem to ophthalmologists, who may feel impelled to withhold treatment because of inevitable operative damage. Surface and penetrating diathermy have been effectively used for three decades in the treatment of retinal detachment. However, 80 years ago, the pathological retinal changes following exposure to concentrated light were described. The author tells of his early experience with cases of over-exposure to sunlight (eclipse blindness), and relates how he became intrigued with the possibility of using a controlled burn with light as a substitute for conventional diathermy. He then outlines his experimental work, giving basic physical principles, and leads up to a description of the present-day light coagulator, with details as to its use.

(Continued on page 869)

(Continued from page 866)

The author gives numerous indications for the use of light coagulation, including: macular holes; peripheral retinal tears, holes and degenerations; retinal cysts; Eales' disease; angiomatosis retinae, and intraocular tumours. It can also be used in certain conditions of the iris, and in the surface of the globe.

It is clearly stated that light coagulation is not a panacea, and contraindications to and complications of the procedures are discussed. The author also makes it clear that further clinical use of the machine and long-term follow-up of cases will be necessary before a definitive appraisal of its significance can be made.

This is an unusually objective treatise by a man who has devoted many years to the development of a new technique. It will be required reading for those few ophthalmologists who are using the light coagulator. (A few are currently in use in Canada.) However, it can be read in a couple of hours, and any practising oculist will benefit from the information it offers. Light coagulation is destined to come into increasing favour, and it would be well to know what type of patients should be referred for this highly specialized procedure.

FACTORS CONTROLLING ERYTHROPOIESIS. James W. Linman and Frank H. Bethell. 200 pp. Illust. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1960. $9.00.

The homeostatic control of red blood cell formation has been the subject of sporadic research activity since the first demonstration of a humoral stimulating factor by Carnot and Deflandre in 1906. Failure of workers to confirm these early findings resulted in a decline of interest, only seriously revived in 1948 by Bonsdorff and Jalavisto. The last decade has seen widespread and productive work in this field, so that at the present time the existence of two separate circulating factors seems fairly well established.

Dr. Linman and the late Dr. Bethell present an introductory survey of the role of previously known hormones in the regulation of erythropoiesis, showing that they have a minor conditioning influence. They then review the methods of detection and assay of the erythropioetic factors, emphasizing the large doses of plasma required to produce an effect in test animals, and the necessity of using multiple parameters of red cell production. A large part of the text is devoted to the chemical, physical and physiological characteristics of the factors, in which field the authors have made notable contributions. Their tentative conclusions are that there are two humoral factors: one thermostable and resembling or identical with batyl alcohol, which stimulates homeoplastic cellular division of erythrocyte precursors without augmenting hemoglobin synthesis; and the other thermolabile and probably a mucoprotein, which stimulates the primitive reticulum to produce red cell precursors and also enhances the synthesis of hemoglobin.

The primary mechanism of control is considered to depend on the relationship between the available oxygen supply and the needs of the tissues. Except in polycythemia vera, the stimulus to production of the factors is thought to be anoxia, whatever the manner in which this is produced. Ablation experiments, particularly those of Jacobsen, tend to place the site of manufacture in the kidney, although separate sites for separate factors are possible. The final chapter deals with the role of the erythropoietic factors in man and their relation to various anemias and to polycythemia. There is an extensive bibliography covering all the significant work on the subject.

This book provides an excellent review of this new and rapidly progressing subject. The treatment of the many apparently conflicting reports on various aspects of current research and the very well considered arguments and speculations of the authors make it at once informative and stimulating. It will interest all hematologists and all who are interested in homeostatic mechanisms.

CLINICAL GASTROENTEROLOGY. F. Avery Jones and J. W. P. Gummer. 652 pp. Illust. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1960. $18.50.

F. Avery Jones and J. W. P. Gummer, gastroenterologist and surgeon respectively at the Central Middlesex Hospital in London, have written a new textbook of considerable value to graduate students and gastroenterologically oriented internists. With a minimum of reference, the authors present their clinical experience in a special gastroenterological unit and comment on the opinions of others, in an easily read, clear and well-balanced volume.

The main emphasis of the book is on diagnosis and management. Special emphasis has been given to differential diagnosis arising from leading symptoms. The chapter on "Symptoms related to disorders of the alimentary tract" is excellent. It is complete yet practical as a guide to diagnosis through intelligent history-taking. The reviewer was delighted to see that achlorhydria at last has been removed from the listed causes of chronic diarrhea..

Esophageal disease has recently received much more recognition, and methods of study are well outlined in this volume, with recognition of the value of the non-operative treatment of achalasia. The chapter on hiatus hernia is concise and practical.

For the physician the description of the varieties of surgical procedures performed for peptic ulcer is useful and reflects a growing attitude for the need of adaptation of surgery to fit the patient rather than for the patient to be subjected to a uniform type of operation. These considerations are of considerable importance in the reduction of frequency in the all too frequent post-gastrectomy syndromes.

Few textbooks have devoted space to the diagnosis and management of massive upper gastrointestinal bleeding. Since these authors in England and E. D. Palmer in America have published their reports on an early and aggressive approach to diagnosis, there has been an appreciation of the incidence of acute lesions as a cause of massive upper gastrointestinal tract bleeding. While the reviewers find it hard to believe that the bedside barium meal technique, previously reported by the same authors and advocated in this text, can have the diagnostic value attributed to it, we heartily endorse the principle of concomitant medical management and vigorous early diagnostic approach.

A chapter is devoted to an evaluation of current diagnostic techniques applicable to diseases of the digestive tract. While most of the common and less frequently encountered affections of the digestive tract are discussed, the authors make no attempt to cover the liver and biliary tract and would like to have this volume regarded as a companion to Sheila Sherlock's excellent book on the subject.

Canad. M. A. J.
April 15, 1961, vol. 84

PUBLIC HEALTH

SUMMARY OF REPORTED CASES OF NOTIFIABLE DISEASES IN CANADA*
ISSUED BY THE PUBLIC HEALTH SECTION, DOMINION BUREAU OF STATISTICS

Disease	Week ended (1961): Jan. 7	Jan. 14	Jan. 21	Jan. 28	Cumulative total since beginning of year: 1961	1960
Brucellosis (Undulant fever) (044)	1	1	1	2	5	4
Diarrhea of the newborn, epidemic (764)	1	1	—	—	2	6
Diphtheria (055)	2	1	1	1	3	2
Dysentery (045, 046, 048)	18	35	37	25	119	387
(a) Amebic (046)	—	—	—	1	1	1
(b) Bacillary (045)	13	11	29	21	78	363
(c) Other and unspecified (048)	5	24	8	3	40	23
Encephalitis, infectious (082.0)	—	—	—	—	—	—
Food poisoning: (049.0, 042.1, 049.2)	10	34	26	39	109	277
(a) Staphylococcus intoxication (049.0)	—	—	—	—	—	236
(b) Salmonella with food as vehicle of infection (042.1)	9	34	26	39	108	38
(c) Unspecified (049.2)	1	—	—	—	1	3
Hepatitis, infectious (including serum hepatitis) (092, N998.5)	140	229	239	210	818	566
Meningitis, viral or aseptic (080.2, 082.1)	1	3	8	—	12	19
(a) Due to Poliovirus	—	—	—	—	—	8
(b) Due to Coxsackie virus	—	—	—	—	—	1
(c) Due to ECHO virus	—	—	—	—	—	1
(d) Other and unspecified	1	3	8	—	12	9
Meningococcal infections (057)	1	1	2	3	7	18
Pemphigus neonatorum (Impetigo of the newborn) (766)	—	—	—	—	—	—
Pertussis (Whooping cough) (056)	20	122	115	91	348	595
Poliomyelitis, paralytic (080.0, 080.1)	—	1	—	1	2	14
Scarlet fever and Streptococcal sore throat (050, 051)	213	252	250	518	1,233	2,746
Typhoid and Paratyphoid fever (040, 041)	—	9	3	3	15	14
Venereal diseases: (020-039)	330	402	343	358	1,458	1,387
(a) Gonorrhea (030-035)	284	352	305	314	1,279	1,217
(b) Syphilis (020-029)	46	50	38	44	179	169
(c) Other† (036-039)	—	—	—	—	—	1

* Figures for the Yukon are received four-weekly and are, therefore, shown in the cumulative totals only.
† Including chancroid, granuloma inguinale and lymphogranuloma venereum.

MEDICAL NEWS *in brief*

(Continued from page 858)

CLINICAL MEETING IN POSTGRADUATE OTOLARYNGOLOGY

The Faculty of Medicine and the Division of Postgraduate Medical Education, University of Toronto, is sponsoring a Clinical Meeting in Postgraduate Otolaryngology, to be held on May 11, 12 and 13, 1961. The Section of Otolaryngology of the Ontario Medical Association will provide the program on Thursday afternoon, May 11, in the Royal York Hotel. No fee will be charged for this session, as it is open to any physician registered for the Annual Meeting of the Ontario Medical Association.

The University of Toronto Postgraduate Course in Otolaryngology, designed for specialists in otolaryngology, will be held on Friday and Saturday, May 12 and 13, in the Central Area, Toronto General Hospital. The fee for this course is $40.00 (Canadian funds), and cheques should be made payable to the Chief Accountant, University of Toronto. The closing date for making application for enrolment is April 21. Application should be addressed to: the Director, Division of Postgraduate Medical Education, Faculty of Medicine, University of Toronto, Toronto 5.

—

THIRD WORLD CONGRESS OF PSYCHIATRY

The forthcoming World Congress of Psychiatry will be held for the first time in the western hemisphere. The Third Congress will take place in Montreal from June 4 to 10, 1961. An outstanding highlight of the program will be the session on Scientific Creativity which will feature discussions by three Nobel Prize winners, Lord Adrian, Dr. Albert Szent-Gyorgyi and Dr. Linus Pauling.

Lord Adrian, 72, Master of Trinity College, Cambridge, and Vice-Chancellor of Cambridge University, one of the world's leading neurophysiologists, was awarded the Nobel Prize for medicine in 1932, together with Sir Charles Sherrington, in recognition of their discoveries of the formation of the neutron.

Dr. Szent-Gyorgyi of the Research Institute of Muscle Research at Woods Hole, Massachusetts, was born in Budapest in 1893 and was educated at Budapest and Cambridge Universities. His Nobel Prize winning discoveries on biological combustion in 1937 opened a new frontier of medical research.

Dr. Pauling, 61, is Professor of Chemistry at the California Institute of Technology. Following his work on the forces binding proteins and other molecules, for which he received the Nobel Prize for chemistry in 1954, he began a study of molecular disturbances leading to mental deficiencies. As a Guggenheim Fellow he studied in Munich, Zurich and Copenhagen. His theory of molecular bonds was outlawed in Stalinist Russia as incompatible with Soviet ideology.

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CANADIAN SOCIETY FOR CLINICAL CHEMISTRY

The Fifth Annual General Meeting of the Canadian Society for Clinical Chemistry will be held on

June 2 (evening) and June 3, 1961, at the Ontario Veterinary College, Guelph, Ontario. All members, friends, and those interested in clinical chemistry are cordially invited to attend and participate. Further details about this year's meeting of the Society will be published in future issues of this journal. All those interested in becoming members of the Society should write now to Dr. D. B. Tonks, Secretary, Hospital for Sick Children, Toronto 2, Ontario.

UNIVERSITY OF SASKATCHEWAN INSTITUTE ON COMMUNITY EDUCATION FOR HEALTH

From June 2 to June 9, 1961, an Institute on Community Education for Health will be held under the joint sponsorship of the Department of Social and Preventive Medicine and the Centre for Community Studies of the University of Saskatchewan, and the Department of Public Health of the Province of Saskatchewan. While primarily focused on the community aspects of health education, the Institute will contain much material that is relevant for the practising physician, the medical health officer, the health educator, the public health nurse and other workers in the health professions.

The first four days will be spent at the University in Saskatoon, and the remainder in Regina. The scientific sessions of the 51st Annual Meeting of the Canadian Public Health Association from June 6 to 8, inclusive, will be incorporated within the Institute program and used as examples of educational method. Seminars for the Institute participants will be arranged each day. The morning of June 9 will be devoted to a review and evaluation of the whole process.

Faculty for the Institute will be headed by Dr. George Rosen, M.D., Ph.D., Professor of Public Health Education at Columbia University, and will include: Professor W. B. Baker, Director, Centre for Community Studies, University of Saskatchewan; Dr. J. Wendell Macleod, Dean, College of Medicine, University of Saskatchewan; Dr. Alexander Robertson, Professor of Social and Preventive Medicine, University of Saskatchewan; Mr. Christian Smith, Director of Health Education for Saskatchewan; and Dr. P. G. Stensland, Chief Training Officer, Centre for Community Studies and Lecturer in Social and Preventive Medicine, University of Saskatchewan.

This year the Canadian Public Health Association annual meeting will include the following items of special interest to practising physicians: an address by Professor James Mackintosh, M.D., formerly Director of Education and Training, World Health Organization, on the topic of "Health, Medicine and Social Change", to be discussed by a panel of leading Canadian physicians; a panel on "Patterns of Practice", contributed to by several practising physicians from a variety of types of Canadian group practice; a paper and panel on "The Prevention of Chronic Disease" led by Dr. Lester Breslow of the Bureau of Chronic Disease of the California State Health Department; two papers on aspects of home care from Dr. T. E. Hunt, Professor of Rehabilitation Medicine, University

(Continued on page 35)

Lifts depression...as it calms anxiety!

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Balances the mood – no "seesaw" effect of amphetamine-barbiturates and energizers. While amphetamines and energizers may stimulate the patient – *they often aggravate anxiety and tension.*

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MEDICAL NEWS *in brief*

(Continued from page 33)

of Saskatchewan, and Miss Constance Swinton, Regional Director of the Victorian Order of Nurses; a discussion of the role of the local health department in medical care, led by Dr. Lester Breslow and a group of leading Canadians; and a panel presentation on health education.

Registration fee for the Institute is $25.00. Accommodation with full board during the sessions in Saskatoon can be arranged for $9.60 per day in University residences. Enrolment will be limited. Application blanks and a brochure providing further details can be obtained by writing to R. F. Badgley, Department of Social and Preventive Medicine, University of Saskatchewan, Saskatoon, Sask.

ANNUAL MEETING, CANADIAN ANAESTHETISTS' SOCIETY

The Annual Meeting of the Canadian Anaesthetists' Society will be held at the Seigniory Club, Montebello, P.Q., May 15-18, 1961, under the presidency of Dr. R. H. Meredith of Toronto. The program is as follows:

May 15

Morning Session: Council Meeting, 1960-61 Council.

Afternoon Session: "Methoxyflurane (Penthrane)"—Dr. Gordon M. Wyant; "Methoxyflurane"—Dr. Fernando Hudon; "McGill University Experiences with Methoxyflurane"—Dr. David Power; "Serotonin Release from Carcinoid Tumours"—Dr. Philip Jones; "A Method of Anesthesia for Bloodless E.N.T. Surgery"—Dr. Harold T. Kay.

9 p.m.: Panel Discussion on Health Services. Chairman: Dr. M. Vivyan Morton.

May 16

Morning Session: Round Table Discussion: "Practical Pharmacology of Premedicant Drugs"; Chairman, Dr. H. B. Graves. Annual General Meeting, Canadian Anaesthetists' Society.

Afternoon Session: "Vanillic Diethylamide for Outpatient Anesthesia Recovery"—Dr. Harry Slater; "Some Trials with Vanillic Diethylamide: A New Analeptic"—Dr. A. Romagnoli; "Blood Transfusion Reactions During Anesthesia: A Clinical Study"—Dr. L. Jenkins; "Halothane-Ether in Cardiac Surgery"—Dr. J. P. Dechene.

May 17

Morning Session: "A Modification of Ayre's Technique"—Dr. Audrey Lewis; "Changes in Bronchopulmonary Resistance Associated with Pregnancy"—Dr. James Kerr; "Continuous Peridural Anesthesia in the Therapeutic Management of Thoracic Trauma"—Dr. Maurice Trahan; "Central Effects of Five Muscle Relaxants"—Dr. Lewis W. Hersey.

Afternoon Session: "A Comparison of the Hepatotoxic Properties of Chloroform and Halothane in the Presence of Hypoxia"—Dr. Frank C. Haley; "The Problem of Obesity in Anesthesia for Abdominal Surgery"—Dr. A. B. Noble;

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MEDICAL NEWS *in brief*
(Continued from page 35)

"Painfree Labour and Delivery with Continuous Epidural Anesthesia"—Dr. Wolfgang Spoerel; "Anti-Emesis: A Review and Present Status"—Dr. Leif Simonsen.

Evening: Annual Dinner. Installation of President.

May 18

Morning Session: Round Table Discussion: "Closed Chest Cardiac Massage"; Chairman, Dr. S. L. Vandewater. "Management of the Patient After Cardiac Arrest"—Dr. W. A. Dodds; "Anesthesia for Surgical Correction of Vascular Ring"—Dr. T. G. McCaughey; "Iatrogenic Disease in Anesthesia"—Dr. Harvey Little.

For further information, write: Dr. R. A. Gordon, Secretary-Treasurer, Canadian Anaesthetists' Society, 178 St. George St., Toronto 5, Ont.

AMERICAN HEART ASSOCIATION ANNUAL MEETING

The 1961 Annual Meeting and Scientific Sessions of the American Heart Association will be held in Bal Harbour, Miami Beach, Fla., October 20 to 24. The 34th annual Scientific Sessions are scheduled from Friday, October 20, through Sunday, October 22, in the Americana Hotel.

May 15 has been set as the deadline for submitting abstracts of papers to be presented at the Scientific Sessions. Papers intended for presentation must be based on original investigations in, or related to, the cardiovascular field. Official forms for submitting abstracts may be obtained from Richard E. Hurley, M.D., Medical Associate, American Heart Association, 44 East 23rd Street, New York 10, N.Y.

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1961 B.C. OTO-OPHTHALMOLOGICAL CONFERENCE

The 1961 B.C. Oto-Ophthalmological Conference will be held in Vancouver on May 17 to 20, under the sponsorship of the E.E.N.T. Section of the B.C. Division of the Canadian Medical Association. The guest speakers in otolaryngology will be Dr. G. C. Halliday of Sydney, Australia, and Dr. K. D. Devine of the Mayo Clinic, Rochester, Minn. The guest speakers in ophthalmology will be Dr. J. Barraquer of Barcelona, Spain, and Dr. A. J. Elliott of Toronto. There will be lectures, demonstrations and round-table discussions. An interesting social program is being arranged for the ladies. For further information write: Dr. G. A. Badger, 925 West Georgia Street, Vancouver 1, B.C.

—

TREATMENT OF DIARRHEA IN INFANTS

Fourteen years ago Govan and Darrow introduced their special electrolyte solution for intravenous use, containing potassium, which has since been widely adopted in pediatric practice. More recently, Darrow and Welsh (*J. Pediat.*, 56: 204, 1960) have carried out a study on 307 infants, suffering from acute diarrhea, admitted to the Children's Mercy Hospital in Kansas City; the study was par-

ticularly directed towards the clinical status of hyponatremia, hypernatremia and metabolic acidosis.

Hyponatremia occurs whenever there is a dissociated loss of sodium, the bodily water remaining little diminished; hypernatremia when water alone is lost, in which case both body Na and Cl will be high; metabolic acidosis is not directly related to the level of the reserves of either Na or Cl. The hydrogen ion concentration of the body fluids in fact changes very little owing to the efficient buffer systems which operate, though replacement of Na, K, Cl ions and water will ultimately be essential for the restoration of the normal acid-base equilibrium. In states of acidosis the reduction of the bicarbonate reserve is accompanied usually by the Na depletion or by a relative excess of Cl with a normal Na level. K depletion however may accompany any diarrheal condition, whether there be an actual depletion of Na or not.

In 105 instances, concerning 102 infants, the concentration of plasma electrolytes was determined on admission. The balance was only mildly disturbed in 18, but was seriously altered in the remaining 87. Among the latter, the concentration of K was below 3 mEq./l. in only 5 out of 84 examinations, and only abnormally high (above 6 mEq./l.) in 17. In 104 estimations of Na, only 15 were abnormally low (below 131 mEq./l.), and only 11 abnormally high (above 150 mEq./l.). The authors note that dangerous symptoms, especially disturbances of cerebral function, rarely develop in states of hypernatremia, save at concentrations exceeding 150 mEq./l. They observe, however, that serious acidosis and dehydration may occur even in the presence of a normal Na concentration in the plasma (e.g. 130-150 mEq./l.). As regards the concentration of Cl ions, levels below 95 mEq./l. were found only in 13 instances, and abnormally high concentrations, exceeding 105 mEq./l., in 53. In the latter, the concentration of Cl ions might be disproportionately higher than that of the Na ions. Among 88 bicarbonate estimations only 20 entered the normal range (more than 20 mEq./l.), the remaining 68 all showing metabolic acidosis.

In treatment, Hartmann's lactate-Ringer solution is used to replace electrolytes and water, being given in quantities of 60-80 ml./kg. body weight, together with 20-40 ml. of 5% glucose in water per kg. body weight. Maintenance fluids in addition to these replacement solutions were infused in the following amounts per 100 calories per diem: 120 ml. of 5% glucose in water, 30 ml. of Hartmann's lactate-Ringer solution and 2mM (mille mols) of potassium chloride. Parenteral fluids were usually required for the first two days of treatment only, oral fluids in the form of glucose solution being administered towards the end of this period. Milk mixtures were then resumed at one-quarter to one-half the normal concentration in amounts of 150 ml. per kg. daily. The Lytren milk preparation used as a routine in the Children's Mercy Hospital contained Na 50, K 20 and Cl 30 mEq./l.

An overall mortality of 4 out of the 307 infants admitted with diarrhea compares favourably with other published reports. On the basis of this study the authors suggest that:

1. Diarrheal infants who show initially a high Cl concentration, low bicarbonate and normal or nearly normal Na concentration in

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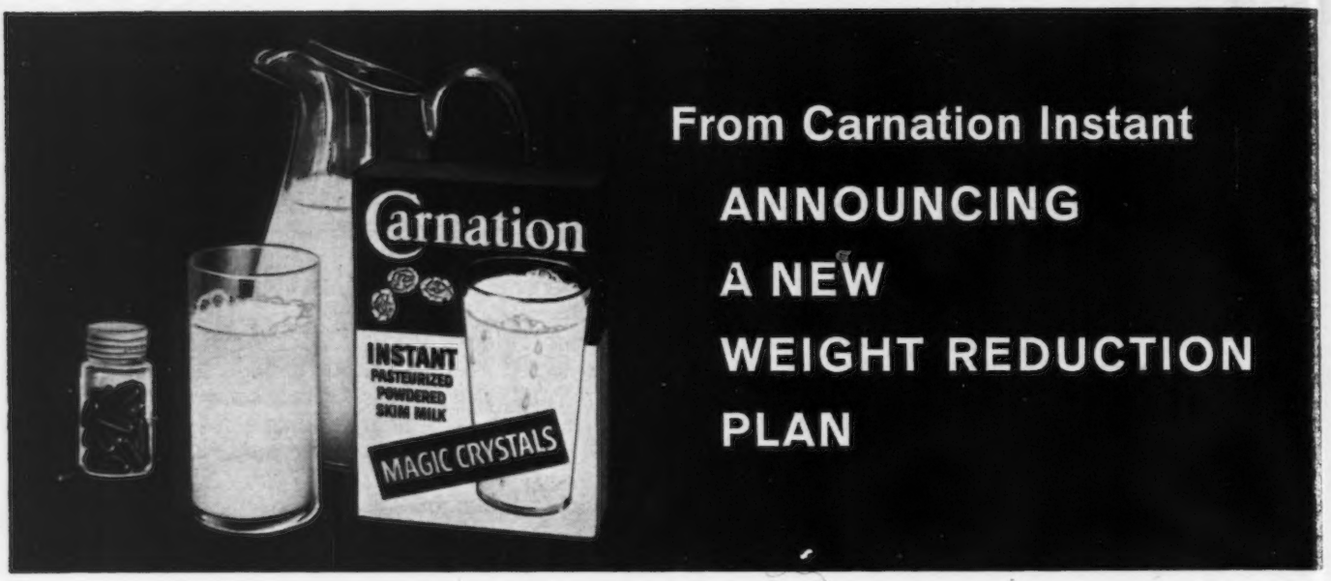

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It's a delicious, new meal-replacement regimen based on Carnation Instant Powdered Skim Milk, fresh, whole milk plus a standard multi-vitamin-mineral supplement.

AN EFFECTIVE PLAN

Carnation's weight reduction plan is nutritionally-balanced, according to the Canadian Dietary Standard. It supplies 998 calories and 72.6 grams of high-quality, hunger-appeasing protein. This concentration of protein helps satisfy the appetite and keeps up the dieter's energy.

EASY FOR PATIENTS TO MAKE

TAKE 1 standard multi-vitamin-mineral preparation each day.

MIX one day's supply (4 glassfuls) of Carnation Plan Formula by stirring together in a container larger than 1 quart:

1½ cups CARNATION POWDERED SKIM MILK (in dry form)
4 cups WHOLE MILK

Mixes instantly. If desired, flavour with instant coffee or a variety of extracts OR for a single glass: Mix a generous ⅓ cup Carnation Instant with 1 cup of whole milk.

COSTS ONLY 39¢ A DAY

The total expense for the Carnation Weight Reduction Plan—including the multi-vitamin-mineral preparation is 39¢ a day.

A FLEXIBLE PLAN

The physician may wish to vary the number of meals the dieter replaces with the Carnation Plan Formula and the number of days the patient stays on the regimen. In this way the physician can adjust the diet to suit the needs of *each* individual patient.

BULK TO PROTECT AGAINST CONSTIPATION

Dieters can snack with low-calorie vegetables and greens like celery, cucumbers, radishes, green pepper, lettuce. These snacks are welcomed by the dieter, and they aid regularity. Coffee and tea (without sugar and cream) may be used. Plenty of water is generally recommended.

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		% Canadian Dietary Standard**			% Canadian Dietary Standard**
Vitamin A	6560 I.U.	160%	Manganese	6.7 Mg.	***
Vitamin D	500 I.U.	***	Magnesium	12.3 Mg.	***
Ascorbic Acid (C)	66 Mg.	220%	Copper	1.3 Mg.	***
Thiamine (B_1)	5.3 Mg.	660%	Zinc	0.5 Mg.	***
Riboflavin	8.8 Mg.	800%	Stomach Concentrate	1.0 Mg.	***
Niacinamide	16.8 Mg.	220%	Folic acid	2.6 Mg.	***
Iron	11.5 Mg.	95%	Choline	310.9 Mg.	***
Calcium	2.7 Gm.	480%	Inositol	266 Mg.	***
Phosphorus	2.1 Gm.	***	Biotin	60.3 Mg.	***
Iodine	.1 Mg.	***	Lysine	25 Mg.	***
Pyridoxine (B_6)	1.7 Mg.	***	Rutin	25 Mg.	***
Ca Pantothenate	11.2 Mg.	***	Boron	0.1 Mg.	***
Vitamin B_{12}	2.0 Mcg.	***	Fluorine	0.1 Mg.	***
Sodium	1.1 Gm.	***	Calories	998	
Vitamin E	10.0 I.U.	***			
Potassium	8.1 Gm.	***			

*Calculation based on a standard multi-vitamin-mineral supplement, 1½ cups Carnation Instant Powdered Skim Milk (in dry form) and 4 cups whole Milk.
**C.D.S. (Canadian Dietary Standard) used for comparison is the daily allowance for a 120 lb. woman of moderate activity. Department of National Health & Welfare.
***C.D.S. (Canadian Dietary Standard) has not been established.

Carnation INSTANT POWDERED SKIM MILK

MEDICAL NEWS *in brief*

(Continued from page 37)

fact are suffering from an absolute deficiency of bicarbonate, Na, K, and water. The last may require replacement in amounts of 100 ml. per kg. body weight, while one-sixth molar sodium lactate may suffice to rectify the major electrolyte imbalance.

2. Similarly affected infants who show initial hypernatremia are in fact deficient in water and K. Acidosis may be present and may call for the administration of bicarbonate or lactate. Replacement is best effected by the administration of fluid in amounts of 100 ml. per kg. body weight comprising 40-50 ml. of lactate-Ringer solution with 3-5mM of KCl, together with maintenance fluids.

—

WISCONSIN'S MEDICAL MUSEUM

Wisconsin's newest museum presents the story of medicine, past and present, and its role in shaping the history of the midwest. Established by the State Medical Society of Wisconsin, the Wisconsin Museum of Medical Progress is housed in a reconstructed military hospital of an old fort in Prairie du Chien, Wis. It was here that the pioneer army surgeon, Dr. William Beaumont, in the 1820's conducted his famed studies that changed the course of modern medicine.

Designed to tell the story of medicine to laymen and professionals alike, the museum's 34 attractive exhibits present a panoramic view of medicine as it moves from the period of the Indian and frontier days through the Civil War years to the time of the "horse and buggy doctors". Other exhibits include the story of Dr. Beaumont's experiments, of medical education from the time of the early "diploma mills" to the modern medical school, and of the history of medical quackery. Exhibits are authentically documented, many of them including surgical and dental instruments dating from the early 19th century.

The new medical museum, a cooperative venture with the State Historical Society, is the result of almost three decades of planning. The Wisconsin State Medical Society has financed a major part of the reconstruction work on the old fort and directed efforts in assembling the historical materials for the museum. Exhibits valued at $8000 were prepared by the State Historical Society, which also operates the museum. The medical society also has a $32,000 administration building and curator's work-shop under construction, and in five years hopes to erect another building to depict the complete story of medical progress through the centuries.

Public enthusiasm for the medical museum ran high, with more than 2300 visitors during the first month of a trial opening last fall. Newspapers and television programs throughout the state carried the story of the opening, undoubtedly contributing to the large attendance during the fall preview. It is estimated that by 1967 there will be about 200,000 visitors each summer.—*A.M.A. PR Doctor.*

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MORTALITY TRENDS

Although advances in the control of the infectious diseases have resulted in very appreciable decreases in mortality at the younger ages, they have also greatly benefited older persons in recent decades, according to reports by

(Continued on page 41)

Canad. M. A. J.
April 15, 1961, vol. 84

CLINICAL REPORT

SUBJECT: On a Specific Benefit of Meat in the Infant Diet

"The fact that the infants receiving a dietary supplement of meat had approximately one-half as many colds as the control subjects, and that the duration of the colds was reduced suggests that the feeding of meat to infants helps to prevent and shorten the duration of colds."

Excerpt from "Further Studies of the Use of Meat in the Diet of Infants and Young Children," Leverton, Clark, Bancroft & Copeman, Journal of Pediatrics, Vol. 40, Pgs. 765–766, '52. Available on request.

MEDICAL NEWS *in brief*

(Continued from page 39)

statisticians of the Metropolitan Life Insurance Company.

The death rate from pneumonia and influenza among white men at ages 65-84 decreased about two-thirds between 1929-31 and 1958; among women the corresponding reduction was as much as four-fifths. Despite these gains, these diseases remain a serious health problem for older persons.

Another dramatic development has been the continuing decrease in the mortality from tuberculosis. Among older men, the death rate decreased by 65% in 30 years in the 65-74 age group, and almost as much in the 75-84 age group. Among women in the 65-84 age range the tuberculosis death rate fell more than 80%.

Among the non-infectious conditions, progress also has been made in controlling the mortality from diseases of the heart, arteries and kidneys, particularly among women. The death rate from these causes among white women at ages 65-74 deceased 27% in the last 30 years, and even at ages 75-84 the reduction was 16%.

Mortality from cancer shows contrasting trends. Among older women, the death rate decreased about 14% at ages 65-74 and about 11% at ages 75-84. Among men, it increased approximately 27% in these age groups, owing predominantly to a marked rise in the death rate from lung cancer.

Accident fatalities among older citizens have decreased considerably in relative frequency since 1929-31, the death rate from all accidents combined dropping nearly 50% for men at ages 65-84, and almost 60% among women in this age group.

"It is likely that further progress will be made in reducing mortality at the older ages," the Metropolitan statisticians conclude. "Because of their dominance in the current mortality picture, the cardiovascular-renal diseases are by far the greatest potential source of future gains. Even in the present state of knowledge, much more can be accomplished in postponing the onset of degenerative diseases, and in prolonging the life of patients with such conditions. Moreover, fuller use of specific means now at hand should make it possible to reduce further the mortality from such causes as diabetes, accidents, pneumonia, tuberculosis, and other infectious diseases."

—

A.M.A. AND CHEST PHYSICIANS PLAN JOINT SESSION IN NEW YORK

A full-day scientific meeting, sponsored jointly by the American Medical Association and the American College of Chest Physicians, will be one of the outstanding features at the 110th annual A.M.A. convention in New York City, June 25-30, 1961.

Dr. Coleman B. Rabin, New York, secretary of the A.M.A. Section on Diseases of the Chest, planned the program for this joint meeting, which will be held on Monday, June 26. Chairman of the morning session will be Dr. Herman J. Moersch, Chicago, chairman of the A.M.A. Section on Diseases of the Chest. Chairman of the Monday afternoon session will be Dr. Hollis E. Johnson, Nashville, Tenn., president-elect of the American College of Chest Physicians.

The joint program, which was arranged so as to be of interest to

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MEDICAL NEWS *in brief*

(Continued from page 41)

specialists and general practitioners alike, will follow the scientific assembly of the American College of Chest Physicians which is holding its 27th annual meeting in New York, June 22-26, just before the A.M.A. session.

The program, which is the first to be sponsored jointly by the two medical organizations, will consist of symposia, panel discussions, the reading of scientific papers, round-table luncheon meetings, and fireside conferences.

Subjects to be covered will include new approaches in the treatment of various forms of heart disease; tuberculosis in general hospitals; steroid treatment in lung diseases; modern diagnostic measures in heart disease; pulmonary diseases and the best forms of treatment; asthma; chronic bronchitis and emphysema; heart catherization; recent advances in the treatment of cardiopulmonary diseases; modern treatment of angina due to stress or effort, and x-ray findings in heart and chest diseases.

Moderators of the symposiums and panels will be Drs. Arthur M. Master, New York; Sol Katz, Washington, D.C., and George C. Griffith, Los Angeles.

One of the scientific papers will deal with the results of operative and high voltage radiation in the treatment of 628 cases of cancer of the lung. It will be read by Dr. David B. Boyd of Boston.

Fireside conferences, at which physicians discuss medical problems of the chest informally, will be held on Monday, June 26, as part of the joint session. These fireside conferences, always a popular feature at the annual meetings of the American College of Chest Physicians, will be built around 36 roundtables where attending physicians, along with prominent scientists, will discuss recent advances in diagnosis and treatment in all phases of heart-lung diseases.

In addition to the formal scientific session, the College will sponsor a new exhibit, entitled "Physiologic and Clinical Testing of Cardiac Function". This outstanding scientific exhibit, approved by the A.M.A. Council on Scientific Assembly, will be shown at New York's Coliseum beginning on Sunday afternoon, June 25.

RESEARCH FELLOWSHIPS, INSTITUTE OF EXPERIMENTAL MEDICINE AND SURGERY, UNIVERSITY OF MONTREAL

Research fellowships in the Institute of Experimental Medicine and Surgery of the University of Montreal are available to any qualified applicant from Canada, the United States or British Commonwealth countries, up to the age of 35, who is seriously considering a career in medical research. The fellowships are annual, subject to renewal consequent to satisfactory performance, for a period of three years. Applications must be received on or before June 1, 1961.

Address enquiries to: Professor Hans Selye, Director, Institute of Experimental Medicine and Surgery, University of Montreal, P.O. Box 6128, Montreal, Quebec.